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**ENVIRONMENTAL REPORT
FOR THE SPATIAL DEVELOPMENT STRATEGY OF
SLOVENIA 2050**



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1. NETEHNIČNI POVZETEK

The Spatial Development Strategy of Slovenia 2050 (hereinafter: SDSS 2050) is a strategic document that focuses on guidelines, but does not refer to any views regarding specific individual projects. It determines the vision and the long-term strategic goals of the government and the basic guidelines for the development of spatial planning activities by 2050, thus defining the basis for future action plans for spatial development at the state, regional, and local levels. More detailed measures to achieve the set goals, activities, operators, deadlines, and funds will be more precisely defined for the medium-term period in the Action Programme by 2030.

The basis of SDSS 2050 are the generally accepted values and norms in Slovenian society, recorded in the Constitution of the Republic of Slovenia; SDSS 2050 uses the Constitution to summarise its fundamental substantive basis. It also follows the basic strategic guidelines and development goals of Slovenia's Development Strategy 2030 (SDS 2030, the Government of the Republic of Slovenia, December 2017) and the priority topics and guidelines of the Territorial Agenda of the European Union 2020 (hereinafter: TA2020)¹. The long-term goals of SDSS 2050 and the policies for achieving these goals refer to promoting polycentric and balanced territorial development, promoting comprehensive development in cities, in the countryside, and in other special regions, spatial/territorial integration in cross-border and transnational functional areas, ensuring global competitiveness of the region, which is based on a strong local economy, better territorial connectivity for individuals, communities, and companies, and managing and integrating the ecological, natural, and cultural values of a region.

The concept of the spatial development of Slovenia supports the enhancement of internal spatial cohesion in the country, Slovenia's developmental inclusion in Europe, and macro-regional integrations. It is a strategic framework for connecting spatial systems and structures, by way of which the vision and the goals of spatial development are fulfilled. The concept was developed on the basis of the simultaneous, synergistic, integral, and interdependent development of three spatial systems: (1) settlement, (2) public infrastructure, and (3) landscape and green infrastructure. The concept follows the principles of polycentric development and the rational organisation of activities in space, it supports the enhancement of the competitive edge of cities and urban centres, while it also ensures the balance of the conditions for development between various areas; it pays special attention to remote and border areas, it encourages local communities to cooperate and complement each other beyond administrative borders, and to create a greater connection between the development of areas and their spatial potentials.

The procedure for comprehensively assessing the impacts on the environment seeks to determine the results of the impacts of the policies, which are planned within SDSS 2050, on the environment; this procedure also includes views regarding impacts which, provided that no mitigation measures are adopted, could be unacceptable due to their environmental effect and non-compliance with environmental goals. This refers to the perspective of all environmental burdens and consideration of all of the foreseeable impacts on the environment, natural resources, nature preservation, human health protection, and cultural heritage.

The impacts of the SDSS 2050 policies on individual segments of the environment and the environmental objectives has been evaluated by using appropriate criteria. They have been classified into prescribed size classes in accordance with the Decree laying down the content of environmental

¹ Territorial Agenda of the European Union 2020 "Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions" – EU Territorial Agenda 2020; adopted at an informal meeting of ministers competent for spatial and territorial development on 19 May 2011, Gödöllő, Hungary.

report, and a detailed procedure for the assessment of the effects on certain plans and programmes on the environment (Official Gazette of the Republic of Slovenia, [*Uradni list RS*] No. 73/05).

In this Environmental Report, cumulative environmental impacts are defined as interactively influencing the environment, caused by the implementation of SDSS 2050 measures and simultaneous implementation of measures within other activities (such as the cumulative impact on the aquatic environment because of the use of water in hydroelectric power plants and the use of water in agricultural production). When the cumulative nature of impacts was being determined, programmes adopted at the state level were taken into account, while the cumulative nature of plans and interventions will be assessed at hierarchically lower levels of planning measures for achieving SDSS 2050 goals.

SDSS 2050 refers to, takes into consideration, and adopts spatial planning goals and principles arising from the documents, guidelines, and recommendations by United Nations bodies, the Council of Europe, and the European Union, so no major transboundary impacts are expected, as they are already defined in current legislative documents. In order to carry out SDSS 2050 policies, which could ultimately significantly impact the environment in neighbouring countries, the procedure of transboundary environmental impact assessment should be carried out in the future phases of drafting project documents.

The SDSS 2050 goals and policies are a logical upgrade of the existing goals of the 2004 Spatial Development Strategy of Slovenia, which laid the foundations for guiding the spatial development of the country. In the next few decades, the implementation of the policies for achieving the SDSS 2050 strategic goals will positively affect the welfare of the country and its people. High quality of life will be based on economical use of resources, protection of the landscape, and preservation of heritage, while people will live in close contact with nature, both in urban and rural areas, which will be connected by means of green infrastructure. Equal access to goods and services will be ensured, daily commuting will decrease significantly, and production will mostly be connected to local resources.

The general mitigation measures and recommendations, which are a condition for the environmental acceptability of the SDSS 2050 policies, and the indicators for monitoring the state of affairs are as follows:

General mitigation measures for achieving the goal (1) 'Ensure sustainable management of soil and forests':

Policies for developing transport infrastructure:

According to SDSS 2050, transport infrastructure is planned integrally, so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services. Furthermore, solutions are adjusted to the issue of accessibility and connectivity, considering the characteristics and needs of various areas – in broader urban and rural areas, including remote and mountainous areas.

SDSS 2050 does not define its view regarding sustainable management of soil and forests, and does not specify its view on the placement of infrastructure in space in a way that it ensures minimum soil degradation and forest conservation and resilience. This is also understandable, as the priority of the integral planning of transport infrastructure is “to resolve issues of accessibility and connectivity”. It is necessary to ensure the attainment of the goals of sustainable management of soil and forests in the procedure of siting each individual transport and infrastructure facility in space. Transport infrastructure can be reconstructed or newly built provided that SDSS 2050 goals have been achieved and that soil degradation and the reduction of forest conservation and resilience are minimal.

In order to ensure sustainable soil management, policies for developing transport infrastructure must be complemented with policies that will promote recycling and the use of own waste mineral raw

materials when building and reconstructing transport infrastructure and, what is more, the use of certified building materials from recycled side products or waste materials generated in other sectors. When using building materials for transport infrastructure that are not of primary natural origin, the fact should be taken into account that:

- large quantities of building materials are used, especially as construction fillings;
- certain hazardous substances from waste materials are permanently mobilised; and
- new building materials may have better functional properties than materials of natural origin.

The general mitigation measures provided for attaining the goal (1) 'Ensure sustainable management of soil and forests' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment, and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **surface area and the proportion of artificial land area**, separately for developed and undeveloped artificial land – indicators of the land use and land cover survey (LUCAS) for the area of Slovenia;
- **surface area and the proportion of forest area** – indicators of the land use and land cover survey (LUCAS) for the area of Slovenia;
- **[OD07] Waste management:** reworking construction waste and demolition waste.

General mitigation measures for achieving the goal (2) 'Ensure the realisation of long-term goals for annual air pollutant emission amounts':

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Indicator for status monitoring:

- **[ZR14] Projections for air pollutant emissions:** the indicator shows data regarding the actual emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), ammonia (NH₃), and dust particles (PM_{2.5}) in the 2000–2015 period and the projections for these pollutants for 2015, 2020, 2025, and 2030. The emissions are shown in kilotonnes (kt).

General mitigation measures for achieving the goal (3) 'Prevent deterioration of the status of surface water and ensure the attainment of good ecological status/potential and good chemical status of surface water':

Policies for developing transport infrastructure:

Transport infrastructure corridors should be sited into the environment by:

- permanently not affecting, directly or indirectly, the hydrological condition of surface water,
- ensuring that the discharge of hazardous materials resulting from transport be prevented,
- preventing leakages/spillages of hazardous materials due to an incident during transport,
- not siting transport infrastructure facilities in a way that would increase flood risk.

Policies for developing energy infrastructure to support a transition into a low-carbon society:

Energy infrastructure should be sited into aquatic environments by:

- ensuring that the surface water status and the related groundwater status do not deteriorate,
- ensuring that a good water status be achieved in the period which is determined in the water management plan for the relevant surface water body,
- ensuring that standards and goals that are prescribed for the area of this water body in accordance with the regulations governing nature preservation be met, and

- ensuring that prior approval be obtained pursuant to regulations (Article 4(7) of the Framework Water Directive 2000/60/EC) in the event of activities affecting the aquatic environment and preventing the achievement of a good water status.

The general mitigation measures provided for attaining the goal (3) 'Prevent deterioration of the status of surface water and ensure the attainment of good ecological status/potential and good chemical status of surface water' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[VD12] Chemical and ecological status of surface water:** this indicator is an assessment of the chemical and ecological status of surface water and is given in accordance with the criteria of the Framework Water Directive 2000/60/EC. The assessment includes all inland surface water, transitional waters, and coastal waters; with regard to the chemical status, territorial water is also included. The basic unit for assessment is a body of water, which means a separate and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, or a stretch of coastal water.

General mitigation measures for achieving the goal (4) 'Preserve or ensure good quantitative and chemical status of groundwater':

Policies for developing transport infrastructure:

Transport infrastructure corridors should be sited into the environment by:

- permanently not affecting, directly or indirectly, the hydrological status of aquifers,
- ensuring that the leaching of hazardous materials resulting from transport be prevented,
- preventing leakages/spillages of hazardous materials due to an incident during transport,
- not affecting the groundwater regime due to the drainage of water from areas behind tunnels,
- not siting transport infrastructure facilities in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- avoiding the siting of transport infrastructure in water protection areas with drinking water sources.

Policies for developing energy infrastructure to support a transition to a low-carbon society:

With the purpose of reducing the effect of impacts on groundwater due to the use of geothermal heat sources, technical regulations, particularly those related to the use of shallow geothermal sources and low-enthalpy hydrothermal sources, should be used to provide rules on how to act with regard to:

- the selection of the most appropriate location of a geothermal heat source,
- the definition of the aquifer's sensitivity to adverse effects,
- the way of re-injecting a fluid when using low-enthalpy geothermal sources,
- the way of using heat from shallow aquifers,
- other techniques to reduce pressures on the existing status of an aqueous environment in the area of influence where a geothermal heat source is used.

The general mitigation measures provided for attaining the goal (4) 'Preserve or ensure good quantitative and chemical status of groundwater' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans

and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[VD15] **Quantitative groundwater recharge**: this indicator is expressed with the quantity of groundwater recharge of shallow aquifers in a hydrological year (1 November–31 October) in all groundwater bodies for the entire territory of the Republic of Slovenia.

-[VD11] **Groundwater quality**: this indicator presents the assessment of the chemical state of groundwater. Based on the monitoring data, the chemical state of groundwater bodies is assessed every year, while an assessment of a six-year reporting period is also conducted in the reporting period of water management plans (WMP). Upward or downward trends in measured values of chemical parameters are monitored as well.

General mitigation measures for achieving the goal (5) ‘Ensure good status of the marine environment’:

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Indicators for status monitoring:

- are equal to the indicators listed in Chapter X of the *2017–2021 Marine Environment Management Plan* as ‘INDICATORS FOR MONITORING THE EFFECTIVENESS OF IMPLEMENTING THE PLAN’S PROGRAMME FOR MEASURES’.

General mitigation measures for achieving the goals (6) ‘Protect and preserve biodiversity’ and (7) ‘Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected’:

Policies for arranging and developing settlements, urban development policies, transport infrastructure development policies:

As foreseen in the text of SDSS 2050, urban development should be prioritised in existing urban and degraded areas; however, if the development of still untouched areas cannot be avoided, the following should be taken into consideration:

- When placing infrastructure for urban development into space, the integration of facilities in areas of valuable natural features must be avoided. Consideration of the guideline will facilitate the preservation of types and characteristics of valuable natural features.

- When siting infrastructure for urban development, it is necessary to avoid the siting of facilities in protected areas. If the interventions cannot be avoided and if this is permitted under the Act on the protection of an individual area, it is necessary to observe the guidelines, starting points and conditions for nature protection in areas that are under protection regimes adopted in acts on protection. Consideration of the guideline will facilitate the protection of protected areas.

- In siting infrastructure for urban development, it is necessary to avoid placing facilities in Natura 2000 areas. Consideration of the guideline will facilitate protecting the connection and integrity of Natura 2000 sites. If interventions are inevitable, interventions and activities must be planned in accordance with the Decree on special protection areas (Natura 2000 areas)(Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 49/04, 110/04, 59/07, 43/08, 8/12, 33/13, 35/13 – amend., 39/13 – Constitutional Court Decision, 3/14, 21/16, 47/18) so that they preserve ecological structures, functions and protection potential.

Pursuant to the objective of the Resolution on National Environmental Action Plan 2005–2012 (Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 2/06): “The increase in the proportion of protected areas in various categories by 10% to 22% of Slovenia’s surface area by 2014,” which has not yet been realised, an increase in the scope of protected areas is to be expected in

the years to come. Therefore, the siting of infrastructure in areas proposed for protection should be avoided in order to prevent possible conflicts and negative impacts on attaining the environmental objectives of nature conservation.

Infrastructure should not be sited on coastal land. Such activities may significantly impact the ecological status of watercourses, and reduce retention areas, and produce cumulative impacts on the biodiversity of the area and ecosystem services of the area. According to Article 37 of the Waters Act, an exception is possible only on the basis of expert argumentation stating that the facility cannot be sited elsewhere without disproportionately high costs. Also, the costs of reducing ecosystem services in the case of interventions in the coastal area have to be included in the cost calculation. The observance of the aforementioned guideline will make the calculation of costs more concrete and adequately balanced. Less siting in the coastal area is anticipated, which will prevent significant negative impacts on the biodiversity of the coastal area.

Policies for developing energy infrastructure to support a transition to a low-carbon society:

1. wind farms must be set up, planned, and maintained so that they do not cause the preservation status of birds, bats, and large carnivores to deteriorate. Generally, it is not permitted to site wind farms in the following areas: protected areas, special protection areas, the heart of ecologically significant areas, which are a central habitat for large carnivores. Wind turbine platforms are not to be located within the 10-metre radius of the entrance area of subterranean caves and in the areas above known cave tunnels. As a priority, wind turbines should be placed in those potential wind farm areas that do not include areas that are very sensitive for birds.

2. hydroelectric power plants should be sited so that they do not affect the distinctive features of important nature conservation areas and their biodiversity (Natura areas, Ramsar areas, IBA, UNESCO areas, ecologically significant areas, natural values, protected areas), so that the conservation of qualification species and habitat types (HT) in Natura 2000 sites is ensured to the greatest extent possible, that aquatic and water-related organisms are preserved, and the conservation of the habitats of protected and endangered species as well as priority HT in the immediate and broader area of the power plants is ensured. The passage and the connectedness of watercourses must be established for fish and other aquatic organisms, river dynamics, bed-load discharges or sediment deposition must be preserved to the greatest possible extent, and the natural ecosystem characteristics of tributaries and their natural structure must be preserved.

General policy: Activities and interventions in Natura 2000 sites (SPA and SCI areas) must be planned pursuant to Article 7 of the Decree on special protection areas (Natural 2000 areas) (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 49/04, 110/04, 59/07, 43/08, 33/13, Constitutional Court Decision – no. 39/13, 3/14, 21/16). It is necessary to carry out assessments of the acceptability of activities in nature pursuant to Article 28 of the Nature Conservation Act (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 96/04 –ZON-UPB2, 46/14- ZON-C). If an activity is carried out, all possible technical and other measures must be foreseen and implemented to make the adverse effects on habitat types, plants and animals and their habitats still acceptable. Especially protection objectives defined for each of the Natura 2000 sites must be taken into account. Interventions and activities in protected areas must be conducted in accordance with the instrument regarding protection and management plan, provided that such an instrument exists.

If replacements of natural habitats are required to reduce the results of the impacts on the protection-related goals in Natura 2000 areas, the effects will be significant. In this case, replacement habitats will have to be defined as compensatory measures in the sense of Article 6(4) of the Habitats Directive, provided that the conditions for conducting the procedure for the dominance of other public benefits are met. In the procedure for the dominance of other public benefits over the public benefit of nature preservation, the dominance of the public benefit of building a hydroelectric power plant over the public benefit of nature preservation must be proved after it has been determined that there are no alternative solutions which would be less harmful to nature. When other public benefits do not directly refer to human health and public safety or when they do not have beneficial consequences that would

be essential to the environment and priority species or habitat types are present in the area, an opinion of the European Commission must be obtained beforehand. The dominance procedure is carried out provided that the implementation of suitable compensatory measures is possible; in the case of Natura 2000 areas, these measures are the replacement of a destroyed habitat or habitat type with the same substance and scope that would ensure comprehensive compliance and connectedness of the Natura 2000 network.

Policies for developing energy networks:

The siting of power lines results in the degradation of the area and a potentially deadly obstacle for birds, particularly due to injuries that may be caused by colliding onto power line elements or electric shock. When locating power lines, the following guidelines should be taken into account:

- Power lines should avoid special protection areas and important bird areas (IBA), especially if major groups of wintering birds concentrate in such areas, or if there are migratory corridors or flight corridors for large birds. If the area can not be avoided, cabling should be undertaken.
- It is recommended that the planned corridor of power lines is placed outside protected areas, Natura 2000 areas and sites with natural values, as well as outside dense forest.
- Multiple power lines should be concentrated along the same corridor, or at least along existing infrastructure corridors.

The general mitigation measures provided for attaining the goals (6) 'Protect and preserve biodiversity' and (7) 'Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **change of the conservation status of species and habitat types** from the report as per Article 17 of the Habitats Directive (92/43/EEC);
- **change of the conservation status of species in the SPA areas and on the territory of the whole Slovenia** from the report as per Article 12 of the Birds Directive (79/409/EEC);
- spatial data (digital layer) for areas with a nature protection status.

General mitigation measures for achieving the goal (8) 'Reduce greenhouse gas emissions':

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Indicator for status monitoring:

- **[PS03] Greenhouse gas emissions:** The indicator shows the movement of greenhouse gas emissions in Slovenia, the main sources of emissions (by category and industry sectors) and a comparison with the EU Member States (EU-28). Emissions for trading (EU ETS) as well as emissions that are not a part of trading are shown. Emissions are shown using the unit Gg CO₂-eq.

General mitigation measures for achieving the goal (9) 'Reduce the vulnerability of infrastructure and settlements to climate change':

Policies for developing transport infrastructure, policies for developing energy infrastructure to support a transition to a low-carbon society, policies for energy networks:

With regard to transport infrastructure, energy infrastructure, and energy networks, guidelines, a methodology, and procedures need to be drafted for how to act when collecting information regarding extreme weather conditions and when planning and implementing:

- measures to improve the resilience of road networks and energy infrastructure to floods;
- measures to improve the resilience of road and energy networks to snow; and
- measures to improve the resilience of the rail and energy network to glaze ice.

The provided general mitigation measures for attaining the goal (9) 'Reduce the vulnerability of infrastructure and settlements to climate change' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[PS01] Estimated damage caused by natural disasters:** The indicator shows the estimation of damage caused by natural disasters that are made by the competent national or municipal commissions through direct inspection of means and goods in private and other ownership that were affected by any form of natural-disaster-related damage. Natural disasters are a result of a natural phenomenon (earthquake, flood, fire, drought, storm, hail, frost, glaze ice, instability or sliding of land and snow), an epidemic (mass communicable diseases in humans), epizootic diseases (mass diseases in animals), damage due to various plant pests and diseases, environmental disasters, and other accidents – the results of human activities and actions, when various events related to performing an activity or managing work assets and when handling hazardous materials go out of hand and threaten the life or health of humans, animals, property, cultural heritage, and the environment.

The analysis of the data collected covers the causes of natural disasters and the percentage of estimated damage according to individual disaster types in relation to Slovenia's annual GDP.

General mitigation measures for achieving the goal (10) 'Provide people with a safe supply of wholesome drinking water in sufficient quantities'

Policies for planning and developing settlements

Development of settlements and siting of infrastructure is to be implemented in such a way as to:

- not have a permanent direct or indirect impact on the hydrological status of aquifers,
- not site settlements and infrastructure in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- avoid the siting of settlements and infrastructure in water protection areas with drinking water sources.

Guidelines for urban development

Urban development of towns and other urban settlements should:

- not have a permanent direct or indirect impact on the hydrological status of aquifers,
- not site dwellings and public service infrastructure in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- avoid the siting of dwellings and public service infrastructure in water protection areas with drinking water sources.

Policies for developing transport infrastructure:

Transport infrastructure corridors should be sited into the environment in such a way as to:

- not have a permanent direct or indirect impact on the hydrological status of aquifers,
- ensure that the leaching of hazardous materials resulting from transport be prevented,
- prevent leakages/spillages of hazardous materials due to an incident during transport,
- not affect the groundwater regime due to the drainage of water from areas behind tunnels,
- not site transport infrastructure facilities in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- avoid the siting of transport infrastructure in water protection areas with drinking water sources.

Policies for developing energy infrastructure to support a transition to a low-carbon society:

With the purpose of reducing the effect of impacts on groundwater due to the use of geothermal heat sources, the following policies must be observed when using shallow geothermal sources and low-enthalpy hydrothermal sources:

- the capacity, rate of flow and quality of the groundwater aquifer must be maintained when utilising geothermal water,
- systems without re-injection are not permissible in the water protection areas,
- facilities for utilising renewable and low-carbon energy sources and accompanying infrastructure must not be sited in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- facilities for utilising renewable and low-carbon energy sources and accompanying infrastructure is also not placed in water protection areas of drinking water sources.

The provided general mitigation measures for attaining the goal (10) 'Provide people with a safe supply of wholesome drinking water in sufficient quantities' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment, and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **[ZD05] Access to drinking water:** this indicator shows the number and percentage of inhabitants of the Republic of Slovenia who are supplied with drinking water from drinking water supply systems that were included in drinking water monitoring.
- **[VD08] Drinking water quality:** this indicator shows the percentage of non-compliant drinking water samples due to microbiological and chemical pollution, by size classes of drinking water supply areas. With regard to microbiological pollution, the indicator shows faecal pollution (presence of the *E. coli* bacteria); with regard to chemical pollution, it shows chemical parameters that are relevant for human health (stated in Appendix I, Part B of the Rules on Drinking Water: Chemical Parameters). In addition to the non-compliance of samples, the indicator also shows the number of people exposed to concentrations of pesticides and nitrates that exceed regulation standards.
- **Indicator of unsuitable protection of a drinking water source:** number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Waters Act. The SDSS 2050 producer prepares the indicator status on the basis of data submitted by the service of the Ministry of the Environment and Spatial Planning responsible for drafting regulations on the protection regime for drinking water sources in water protection areas.

General mitigation measures for achieving the goal (11) 'Reduce the exposure of people to polluted air':

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Indicators for status monitoring:

- **[ZR11] Air quality:** the indicator shows excessive limit values of sulphur dioxide (SO₂), particles (PM₁₀), ozone (O₃), and nitrogen dioxide (NO₂) in the 1992–2006 period.
- **[ZR08] Air pollution by PM₁₀ and PM_{2.5} particulate matter:** the indicator displays the number of days when daily ceiling concentration of PM₁₀ of 50 µg/m³, movement of average annual concentration of PM₁₀ and PM_{2.5}, and average exposure to PM_{2.5} particles.
- **[ZR07] Air pollution by ozone:** this indicator shows the number of days with exceeded ozone target value and the number of hours with exceeded information value within a calendar year.

General mitigation measures for achieving the goal (12) ‘Reduce the exposure of people to excessive noise’:

Policies for developing transport infrastructure:

Transport infrastructure corridors should be sited into the environment by:

- ensuring that transport does not cause excessive burdening of the environment through noise,
- ensuring that transport does not increase total noise pollution in an area where pollution was excessive prior to the introduction of new transport infrastructure;
- ensuring that noise protection measures are taken to prevent and reduce noise in the environment as a result of transport.

The provided general mitigation measures for attaining the goal (12) 'Reduce the exposure of people to excessive noise' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[PR18] Exposure to noise from transport:** the indicator shows noise exposure along important roads and railway lines, and noise exposure in areas of settlements (Ljubljana and Maribor) from road and rail transport, and important industrial facilities and devices in the *Lden* and *Lnight* periods.

General mitigation measures for achieving the goal (13) ‘Prevent adverse effects on human health from the perspective of EMR and light pollution’:

Updating the Decree on limit values due to light pollution of the environment (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 81/07, 109/07, 62/10 and 46/13), about the state of technologies relating to exterior lighting, and the execution of a more effective supervision of implementing provisions of this Decree. The provisions of the above Decree would have to be recast and observe the recently published EU green public procurement criteria for road lighting and traffic signals, SWD(2018) 494 final. The Ministry of the Environment and Spatial Planning is responsible for updating the Decree or implementing the general mitigation measure.

The criteria for EU green public procurements are drafted in such a way that they facilitate the purchase of goods, services and works with reduced impact on the environment. The application of criteria is voluntary, but their transposition in the recast Decree on limit values due to light pollution of the environment would make them mandatory for exterior lighting in Slovenia.

The criteria for exterior lighting must be designed in such a way as to:

- promote the use of dimming controls for at least 50% of the maximum light intensity of exterior lighting,

- ensure optimisation and monitoring of energy consumption of individual lighting device in real time,
- light sources do not emit light over horizontal plane. If new light sources are installed on the existing posts where lights are deliberately tilted, the exterior lighting operator must provide additional protection so that light sources emit light over horizontal plane,
- at least 97% of all light falls within a downward angle of 75.5° to the vertical for the reduction of obtrusive light and glare,
- mandatory dimming in areas of protected residential premises (residential areas and hospitals) is promoted, and
- determine limitations for the share of blue light (G-index) for lights.

Indicator for status monitoring:

- **Annual electricity consumption of all lights that are built in the lighting of public surfaces in the territory of an individual settlement calculated per capita;** whereby electricity consumption for LED bulbs and gas discharge lamps is determined and assessed separately.

General mitigation measures for achieving the goal (14) ‘Ensure optimum distribution of activities in space’:

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Indicators for status monitoring:

- **[SE03] Human development index:** The indicator shows the Human Development Index, which is an important indicator of the complexity of the relationship between income and well-being as well as the interwovenness and interconnectedness of economic and social policies. The HDI presents welfare in three areas of social development: health (life expectancy at birth is used to assess length of life and health conditions), income or access to resources that enable people to achieve a decent standard of living (GDP per capita at purchasing power parity) and education level or knowledge attained (gross inclusion and literacy rate that indicate the combined rate of enrolment at various levels of education or literacy rate of the adult population).
- **[TU01] Development and distribution of tourism:** The indicator shows the number of available beds and of overnight stays in the 1992–2009 period.
- **[SE01] Gross domestic product:** The indicator shows the gross domestic product per capita according to purchasing power in Slovenia.

General mitigation measures for achieving the goal (15) ‘Ensure the preservation of a low flood risk or reduce flood risk’:

Policies for developing energy infrastructure:

When siting hydroelectric power plant dams into aquatic environments, it must be ensured that flood risk in the area of influence of a hydroelectric power plant does not increase due to:

- a risk of floods because of improper operations, such as an event with simultaneous emptying of the reservoir and the occurrence of a flood wave in the watercourse, and
- a risk of a flood because of the demolition of a dam.

The provided general mitigation measures for attaining the goal (15) 'Ensure the preservation of a low flood risk or reduce flood risk' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[ZD24] Proportion of resident population living in flood zones:** The indicator shows the share of people living in flood zones.

General mitigation measures for achieving the goal (16) ‘Ensure comprehensive cultural heritage preservation’:

Policies for developing transport infrastructure:

The development of transport infrastructure may impact units and areas of cultural heritage especially in terms of the degradation of landscape features of the surroundings of cultural heritage units, damage to cultural heritage facilities, and the destruction of archaeological remains during the construction of facilities by vibrations which could cause damage to buildings of cultural heritage. To avoid these impacts, the following must be considered:

- infrastructure corridors should not be placed in areas of cultural heritage as a priority.
- From the aspect of preserving archaeological remains, activities in the environment are considered destructive acts (e.g. excavation). Extensive preliminary archaeological research will have to be carried out, its results will have to be taken into account when siting transport infrastructure, and measures to preserve archaeological remains will have to be implemented.
- When integrating transport infrastructure into the environment, upgrading within existing transport corridors has priority over new construction.

Policies for developing energy infrastructure to support a transition to a low-carbon society:

Strategic guidelines for siting hydroelectric power plants:

- According to the fundamental protection premise, small hydroelectric power plant and hydroelectric power plant locations must avoid cultural heritage units, while solutions must preserve the protected characteristics of the affected cultural heritage units by taking into consideration their legal protection regimes, i.e. ordinances on protection in the event of affected cultural monuments.
- Structures and areas of cultural heritage must also be protected from damage or destruction during construction; no construction access ways or detours should run across structures and areas of cultural heritage; the latter must not be overlapped by any necessary rearrangements of waterways or irrigation systems, public utility, energy or telecommunications infrastructure, nor may they be used to dispose of surplus materials, etc.
- In the detailed planning of hydroelectric power plants and associated infrastructure, some preliminary archaeological research will be necessary and, when required, also adjustments to the solutions of the spatial planning act, rescue excavations, and the presentation of the remains at the discovery site.

Strategic guidelines for siting wind farms:

- In the areas of individual turbines and the associated infrastructure, prior archaeological research will be required.
- The fundamental protection platform is that wind power plants must avoid protected areas and structures of cultural heritage, while the solutions must observe the preservation of protected heritage features. If this is not possible, the protection regime and policies must be taken into consideration in order to prevent the impact or suitably reduce it.
- It is estimated that at the stage of individual turbine siting, adjustments to (avoiding) individual heritage structures and areas will be possible, since there is a relatively large potential for coordination and optimisation. Impacts on the visual image of heritage in the broader locality are to be mitigated by observing the general mitigation measures for landscape protection (see chapter Landscape).

Strategic guidelines for utilising solar power:

Spatial planning documents should lay down the conditions for implementing spatial planning in such a way that will make the installation of solar thermal collectors or concentrators on cultural heritage structures or in cultural heritage areas and their impact areas impermissible, or stipulate the assessment of the acceptability of respective cases and the provision of a technological solution that will ensure

the protected heritage features are not affected in any way. Persons responsible for drafting spatial planning documents are also responsible for the implementation. The Strategic Environmental Assessment Division of the ministry competent for culture verifies the appropriateness of the siting in the procedure of strategic environmental assessment.

Guidelines for energy networks:

If the expansion and upgrade of transmission and distribution networks is not possible on the existing power line routes and they affect open space, the following should be taken into account:

- When siting new structures in space, the principles of protection of cultural heritage should be respected when planning in more detail – especially the principle of avoiding structures and areas of cultural heritage; individual protected heritage features should also be taken into account in the same manner.
- In areas of pylon sites or along cable conduit routes, ex ante archaeological research should be carried out, and, if necessary, an optimisation of the intervention, so as to avoid unnecessary interventions in archaeological remains.

The provided general mitigation measures for attaining the goal (16) 'Ensure comprehensive cultural heritage preservation' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **status of areas and structures of cultural heritage:** in addition to quantitative data about the areas and structures of cultural heritage, the indicator also consists of an expert opinion.

General mitigation measures for achieving the goal (17) 'Ensure the preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image*':

Policies for developing transport infrastructure:

To ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image, the following guidelines must be pursued:

- Infrastructure corridors should not be integrated into exceptional landscape areas or landscapes with distinctive features at the national level.
- Proper technical measures must be applied to provide a high-quality landscape image by pursuing natural and cultural features and the topography of the area, especially in the case of activities in naturally preserved and culturally rich landscape units.
- When integrating transport infrastructure into the environment, upgrading within existing transport corridors has priority over new construction.

Policies for developing energy infrastructure to support a transition to a low-carbon society:

Strategic guidelines for siting wind farms:

- Individual wind turbines should be sited in the environment so as not to affect areas with distinctive landscape and exceptional landscape. Furthermore, when selecting a location, visibly exposed locations (mainly if wind farms are in the "first plan" of the most frequented points of view), naturally preserved landscape, and open landscape (grassland, rocky landscape) should be avoided.
- When siting individual sites for wind farms and other mandatory accompanying infrastructure in potential areas for wind farms, the following should be taken into account: In locations where border sections of exceptional landscape are included in potential areas for wind farms by virtue of making

use of land with favourable wind conditions, special attention should be given to the details of farm siting. The measures pertain to the optimisation of the siting of individual structures and plants for the utilisation of wind energy, or the accompanying infrastructure within individual potential areas for the construction of wind farms in the subsequent planning phases in a manner that will enable distinctive landscape features within individual areas to be preserved to the greatest extent possible, and that changes to the landscape image be as small as possible or such that the landscape image of areas with wind farms remains as coherent as possible.

Strategic guidelines for siting hydroelectric power plants:

As a priority, new small hydroelectric power plants are sited at existing dams, which are water infrastructure facilities intended for damming or directing water flow, whereby the energy potential of the watercourse must be checked beforehand.

Large hydroelectric power plants: The following policies are mainly to be taken into account to reduce impacts on the landscape and its development:

- active planning of the edges of impoundment, enabling the preservation of individual landscape features (for instance preservation of parts of the body of water and streams) and re-establishment of substitute landscape features (for instance gravel bars and riparian vegetation);
- designing escarpments by taking into account the surrounding landscape properties of the area and enabling the recreational use of the area along the impoundments;
- sustainable design of riverbeds and the riparian space of tributaries;
- recreational solutions;
- expert architectural design of hydroelectric facilities and their placement in the surrounding landscape and settlements;
- diligent planning of the alignment of accompanying long-distance power lines and the implementation of measures for the restoration of bared escarpments as rapidly as possible, by the use of biological and engineering measures if feasible.

Strategic guidelines for siting solar power plants:

The spatial planning documents should define the (im)permissibility of siting solar power stations by individual spatial planning units or categories of dedicated use of land. As a rule, it should only be permissible to install solar power stations on structures or in a manner (including solar concentrators) that does not present an independent spatial arrangement in the landscape, but rather as part of a comprehensive spatial arrangement (e.g. for an infrastructural or industrial facility, rehabilitation of degraded (brownfield) areas).

Guidelines for energy networks:

To ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image, the following guidelines must be pursued:

- In the event of expansion, distribution and transmission networks should not be integrated into exceptional landscape areas or landscapes with distinctive features at the national level.
- Priority planning of networks within existing power line and heating installation corridors.
- Proper technical measures must be applied to provide a high-quality landscape image by pursuing natural and cultural features and the topography of the area, especially in the case of activities in naturally preserved and culturally rich landscape units.

The drafting of landscape designs at the lowest levels of planning, which include evaluation of the status and planning of protection and development of landscape recognisability elements is important for directing and a detailed determination of spatial development and protection in individual landscape areas.

The provided general mitigation measures for attaining the goal (17) 'Ensure the preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS

2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such:** Pursuant to the recast methodology within the target research project, 'Upgrade of the methodology for determining nationally recognised landscape areas', exceptional landscape areas and landscape areas with distinctive features, and their number and scope will be determined anew. Their future reference status will also be defined, which will be the subject of the Action Programme for the Implementation of SDSS 2050.

- **actual use in exceptional landscape areas and landscape areas with distinctive features:** the selected indicator determines the change in the actual use of space in exceptional landscape areas and landscape areas with distinctive features, which is used to establish the trend of changing exceptional landscape areas and landscape areas with distinctive features. The authors of the Environmental Report have recognised the lack of an indicator for reference status in order to monitor changes of the actual use in exceptional landscape areas and landscape areas with distinctive features, and the lack of a reference status to monitor changes in other landscape areas. As a measure, we propose that their reference status be determined on the basis of results of the target research project, 'Upgrade of the methodology for determining nationally recognised landscape areas' and the upgrade of the Regional classification of landscape types in Slovenia (Marušič, I. 1998. *Regionalna razdelitev krajinskih tipov v Sloveniji*. Ljubljana, Ministry of the Environment and Spatial Planning of the Republic of Slovenia, Spatial Planning Office of the Republic of Slovenia) within the Action Programme for the Implementation of SDSS 2050.

* *The landscape image refers to an individual landscape unit determined within the Regional classification of landscape types in Slovenia (Marušič, I. 1998. *Regionalna razdelitev krajinskih tipov v Sloveniji*. Ljubljana, Ministry of the Environment and Spatial Planning of the Republic of Slovenia, Spatial Planning Office of the Republic of Slovenia). The landscape image of units are defined by landscape patterns that are simultaneously the main holders of landscape character. The landscape units were classified within the Regional classification of landscape types in Slovenia on the basis of nature preservation, diversity, spatial order and harmony, while the criteria of symbolic importance of natural and cultural elements were also added. As per the evaluation, the assessment of the status of landscape units was determined, which serves as the basis for monitoring the devaluation of the landscape image. Based on the results of the target research project, 'Upgrade of the methodology for determining nationally recognised landscape areas', and the upgrade of the Regional classification of landscape types in Slovenia, the criteria for high-quality landscape image will be defined.*

2. INTRODUCTION

2.1 GENERAL

The Spatial Development Strategy of Slovenia 2050, drafted on the basis of Articles 66 to 69 of the ZUREP-2, serves as the framework spatial development plan and is classified as a strategic document among the programmes whose measures will have a significant impact on the environment, which is why the procedure of strategic environmental assessment must be carried out before its adoption as per Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (Decision of the Environment and Spatial Planning no. 35409-62/2015/8 of 28 July 2015). The assessment of acceptability according to the regulations on nature conservation must be implemented within the procedure.

As part of the strategic environmental assessment, the effects of SDSS impact on the environment must be assessed, and it is necessary to weigh in on those content, which must be amended/supplemented when mitigation measures are omitted due to the environmental impacts and/or non-compliance with environmental goals.

Steps within the procedure of strategic environmental assessment are shown in the table below.

Table 1: Steps in the procedure of strategic environmental assessment

Seq. no.	Steps in the procedure of strategic environmental assessment
1	Introduction of draft SDSS 2050
2	Starting points for drafting the Environmental Report
2.1	Review of the state of the environment in the territory of the Republic of Slovenia
2.2	Determining environmental objectives of assessment and indicators for attaining these objectives
2.2	Submission of the starting points/Involving the ministry responsible for the environment and relevant spatial planning authorities in the scoping phase
2.3	Supplementing the starting points
3	Environmental Report
3.1	Review of data on the environment or parts of the environment impacted by SDSS
3.2	Analysis of environmental impacts
3.3	Evaluation of environmental impacts
3.4	Proposal for mitigation measures and monitoring of the situation
3.5	Submission of the Environmental Report
4	Amending and exhibiting the Environmental Report
4.1	Public exhibition and presentation
4.2	Obtaining opinions of spatial planning stakeholders
4.2	Drafting positions on comments or opinions
5	Supplementing SDSS 2050 and the Environmental Report after public exhibition (relating to the positions adopted on comments)
6	Obtaining opinions of spatial planning stakeholders (inter-ministerial coordination)
7	Obtaining a decision of the Ministry of the Environment and Spatial Planning

2.2 EFFICIENCY OF THE PROCEDURE OF STRATEGIC ENVIRONMENTAL ASSESSMENT AND HIGHLIGHTS OF THE ENVIRONMENTAL REPORT PREPARATION PROCESS

Within the environmental impact assessment procedure, impacts are determined based on the Environmental Report, which must be provided by the programme producer, i.e. the Ministry of the Environment and Spatial Planning, the Spatial Planning, Construction and Housing Directorate. The procedure is carried out by the Ministry of the Environment and Spatial Planning, the Strategic Environmental Assessment Division (hereinafter: MOP SSPVO). Within the scope of the said procedure, the cooperation of all state bodies and organisations responsible for individual sectors, as well notification and public participation are all provided for.

The SDSS is a steering strategic document, which does not take a position on new activities in the environment necessary for the implementation of individual policies to attain the goals of spatial development. It determines long-term strategic objectives of the state and fundamental guidelines to obtain goals and implement the concept of spatial development by 2050. The SDSS is not an action plan, but a strategic document providing general policies for future action plans for long-term spatial development at the national, regional and local levels by 2050.

The SDSS assessment consists of two interconnected substantive sets. The first set includes the strategic evaluation of SDSS 2050 (Biotechnical Faculty, 2019), whose purpose was to contribute to attaining consistency and integrity of the document (goals, measures and policies) and the synergistic relationship between the measures of spatial and other policies, particularly those that may have a key impact on the design and contribute to the implementation of spatial policies (traffic, energy, environmental, etc.). The strategic evaluation provided guidelines or starting points for strategic assessment of environmental impacts, which are included in the second substantive set. In accordance with the legislation on the comprehensive environmental impact assessment, the methodology for drafting the environmental report was used for the strategic environmental assessment. The strategic quality of the Environmental Report is ensured by means of connections with the strategic evaluation described in more detail in Chapter 3.3 Connection of the strategic evaluation with the environmental impact assessment.

The aim of the joint production of the strategic evaluation and the strategic environmental assessment is to examine the possibilities for better integration of spatial and environmental content and to obtain a proposal of methodological solutions that would improve such integration (Biotechnical Faculty, 2019). The purpose of the comprehensive environmental impact assessment is to provide a high level of environmental protection and contribute to the inclusion of environmental aspects in the drafting of the Strategy. Therefore, the authors of the Environmental Report (also as the strategic evaluation providers) were included in the process of drafting the Strategy already in the initial phase of document preparation. The authors of the Environmental Report were involved in the procedure of the renewed SDSS by means of:

- active cooperation when forming environmental starting points of SDSS 2050 in order to harmonise environmental and development goals of the Strategy and the integration of environmental content in development scenarios of SDSS 2050,
- participating at public consultations on the renewed SDSS by preparing materials and discussing environmental starting points,
- cooperating with focus groups,
- attending, and active participation, at expert meetings/workshops for the renewed SDSS, meetings at inter-ministerial level,

- attending, and active participation, relating to inclusion of the strategic environmental assessment in drafting SDSS.

When SDSS 2050 and the Environmental Report were drafted, both documents were being promptly harmonised. In the process of assessing the Strategy, the authors and reviewers of the Environmental Report submitted proposals and notes to improve the document assessed, including:

- a note on the exclusion of exceptional landscape areas and landscape areas with distinctive features from SDSS,
- a note on insufficient discussion of cultural heritage in Chapter *1.5.4 Guidelines for nature protection areas and cultural heritage areas*, since policies were determined only for cultural monuments and sites,
- a proposal for supplementing Chapter *1.5.2 Guidelines for tourist areas* stating that tourism can contribute to preservation of cultural heritage in remote and border areas,
- a proposal to supplement the definition of green infrastructure which is too one-sided when providing ecological connectivity,
- a proposal to supplement Chapter *5.1.1 Guidelines for planning and developing settlements* referring to forest conservation near settlements.

The methodology of assessing environmental impacts when implementing individual guidelines from SDSS does not equal the methodologies of assessing action plans. The methodology of assessing environmental impacts is directed towards evaluating consequences on the environment due to the development of all areas in the country and the use of their local spatial potentials (sources). Since SDSS fails to define and provide detailed developments in the environment due to the implementation of individual policies to attain goals of the country's spatial development (this will be included in the Action Programme for the 2020–2030 Period), this Environmental Report does not contain environmental impact assessments for individual phases of implementing policies, such as construction or decommissioning of facilities and infrastructure. Furthermore, this Environmental Report includes only long-term or permanent effects of the activities in the environment due to the implementation of an individual policy from SDSS.

This Environmental Report consists of indicators of the state of the environment and indicators for assessing effects of individual policies from SDSS, including indicators for monitoring the state of the environment as the result of implementing policies from SDSS selected in a such a way that:

- the indicators of the state of the environment usually express the state of the entire existing burden of the environment,
- the indicators for assessing effects and those for monitoring the state of the environment after implementing policies from SDSS usually describe additional burdening (or unburdening) of the environment due to the environmental impact caused by the implementation of an individual SDSS policy.

Individual activities in the strategic environmental assessment procedure are provided below, from which is evident that extensive harmonisation took place between various ministries and the author of the Environmental Report, which enables the basic quality level of the environmental assessment.

Phases of the task	Description of activity	Result/milestone
Introduction to work	Introductory meeting with the Client and the takeover of the material Review of the draft SDSS Harmonisation of the schedule with the Client	Meetings with the Client: 18 May 2016, 19 July 2016, 19 September 2016

2.1 Implementation of scoping	<p>Defining environmental content and starting points for drafting the Environmental Report, i.e.:</p> <ul style="list-style-type: none"> environmental goals defined according to the provisions of ratified international treaties, EU and Slovenian regulations, analyses of the existing state and strategic characteristics of sectoral policies; assessment criteria that can represent the levels of deviation from the indicators of state of the environment, levels of attaining protection objectives or other criteria, which provide for a suitable impact assessment; methodologies for determining effects of SDSS programmes on the environment, nature conservation, human health protection, and cultural heritage; method for assessing effects of SDSS programmes on the environment, which must determine all important impacts of the programme on the environment; examining compliance of environmental goals with the objectives of SDSS strategic development guidelines. <p>Particular attention is paid to the following SDSS 2025 priority fields being discussed: vision of spatial development and objectives, functional urban areas, cities, priority areas for the use of RES, rural areas and green networks, sea and coast, and border and mountain areas.</p>	<p>Interim report (Part II: Report on defining the scope and content of the strategic environmental assessment) Submitted on 19 July 2016</p> <p>Working meeting with the Client 23 March 2017, where environmental starting points were discussed:</p> <ol style="list-style-type: none"> methodology (expansion and upgrade), overcoming the dichotomy environment/space; content of the strategic environmental assessment (which are the objectives; is the purpose integration or determining compliance, indicators, expected results); compliance between strategic evaluation and the strategic environmental assessment (of environmental objectives).
2.3 Ensuring integration of environmental and spatial objectives in SDSS	Review of policies and conclusions of the strategic evaluation, and agreement on the manner of integrating the foregoing while drafting material for continuing the procedure of strategic environmental assessment (the SEA procedure).	Harmonisation at the meeting with the Client on 18 May 2016, 19 July 2016, 19 September 2016, 23 March 2017; supplemented SDSS interim report with an attachment (replies to questions), internal meetings.
2.4 Support to the Client when coordinating SDSS stakeholders	Participation at meetings of the SDSS producer; participation at meetings with protection sectors; participation at expert public discussions.	<p>Ongoing (until the submission of the final Report on defining the scope and content of the strategic environmental assessment):</p> <p>presentation material;</p> <p>participation at the presentation of Slovenia's spatial development model, 14 November 2017;</p> <p>meeting of 20 December 2017 where environmental starting points were presented to the protection and spatial planning operators;</p> <p>meeting with the Client on 30 November 2017 where the preliminary draft SDSS was presented;</p>

		meetings with protection sectors in order to present the preliminary draft SDSS 30 November 2018, 18 and 21 December 2018, 8 January 2019.
3.1 Preparation of the Environmental Report and support to the Client when coordinating SDSS stakeholders	Participation at meetings of the SDSS producer, participation at meetings with protection sectors.	<p>Environmental Report for the Spatial Development Strategy of Slovenia 2050 and the Appendix on Protected Areas Submitted on 8 May 2019</p> <p>Participation at the presentation of the draft SDSS and the Environmental Report for SDSS to the protection and spatial planning operators on 13 May 2019;</p> <p>ongoing harmonisation of documents at meetings with the Client, 27 March 2019, 11 April 2019, 25 April 2019, 14 June 2019, 30 July 2019, 21 November 2019;</p> <p>coordination meeting with the Client and the Strategic Environmental Assessment Division on 12 July 2019;</p> <p>coordination meetings with the protection and spatial planning operators on 28 August and 6 December 2019 with the Ministry of Culture, on 9 September 2019 with the Ministry of Agriculture, Forestry and Food, on 11 September 2019 with the Ministry of Health.</p>

In the procedure of strategic environmental assessment, a report entitled “Starting points for drafting the environmental report (Report on defining the scope and content of the strategic environmental assessment)” (Aquarius, 2017) was prepared in the scoping phase. The report defines:

- environmental objectives of the programme in terms of its characteristics; especially its area and content;
- assessment criteria which can represent the levels of deviation from the indicators of state of the environment, levels of attaining protection objectives or other criteria, which provide for a suitable impact assessment;
- relevant environmental fields being assessed;
- methodology for establishing impacts.

Draft report “Starting points for drafting the environmental report” was presented at the meeting with line ministries (20 December 2017) and submitted to MOP SSPVO, which asked relevant line ministries for their opinions. The draft report was supplemented as per the meeting conclusions with

the line ministries. The indicator for assessing impact on cultural heritage was updated (it observes the state of cultural heritage and not only the number of protected units).

Written opinions to the “Starting points for drafting the environmental report” were forwarded by:

- Institute of the Republic of Slovenia for Nature Conservation, Central Unit (opinion no. 8-III-97/2-O-18/TK of 2 March 2018),
- Ministry of the Environment and Spatial Planning, Slovenian Water Agency (opinion no. 35027-2/2018-3 of 6 March 2018),
- Ministry of Health, National Laboratory of Health, Environment and Food (opinion no. 212b-09/1649-18/NP – 1047615 of 12 March 2018),
- Ministry of Agriculture, Forestry and Food, Agriculture Directorate (opinion no. 350-4/2015/19 of 17 April 2018).

After the receipt of opinions, “Starting points for drafting the environmental report” were updated (March 2019), whereby two new environmental objectives were added among other things, i.e. 'Ensure good status of the marine environment' and 'Ensure the preservation of a low flood risk or reduce flood risk'. The environmental objective for surface water was also amended, including the indicator for environmental objective 'Reduce the exposure of people to excessive noise'.

In May 2019, the Environmental Report was submitted to MOP SSPVO for the first time, which then asked other relevant line ministries for their opinions. Opinions about the suitability of the Environmental Report were submitted by:

- Ministry of Agriculture, Forestry and Food, Forestry and Hunting Directorate (opinion no. 350-4/2015/29 of 29 May 2019),
- Ministry of the Environment and Spatial Planning, Slovenian Water Agency (opinion no. 35027-1/2019-5 of 29 May 2019),
- Ministry of Health, National Laboratory of Health, Environment and Food (opinion no. 212b-09/1649-19/NP – 1047615-1 of 29 May 2019),
- Institute of the Republic of Slovenia for Nature Conservation, Central Unit (opinion no. 8-III-267/2-O-19/TK of 31 May 2019),
- Ministry of Agriculture, Forestry and Food, Agriculture Directorate (opinion no. 350-4/2015/30 of 31 May 2019),
- Ministry of Culture (opinion no. 350-1/2015/89 of 3 June 2019).

After obtaining opinions from relevant stakeholders, a coordination meeting was carried out with MOP SSPVO on 12 July 2019 in order to discuss opinions submitted by line ministries to the Environmental Report for SDSS 2050. In letter no. 35409-62/2015 of 29 July 2019, MOP SSPVO issued a requirement to supplement the Environmental Report. The Report was updated (August 2019) based on the letter and submitted again to MOP SSPVO, which repeated their request to the relevant line ministries to provide their opinions. New opinions about the suitability of the Environmental Report were submitted by:

- Ministry of Health, National Laboratory of Health, Environment and Food (opinion no. 212b-09/1649-19NP – 1047615-11 of 9 August 2019),
- Institute of the Republic of Slovenia for Nature Conservation, Central Unit (opinion no. 8-III-267/5-O-19/TK of 13 August 2019),
- Ministry of Culture (opinion no. 350-1/2015/95 of 29 August 2019),
- Ministry of Agriculture, Forestry and Food, Forestry and Hunting Directorate (opinion no. 3401-4/2015/39 of 30 August 2019),
- Ministry of the Environment and Spatial Planning, Slovenian Water Agency (opinion no. 35014-12/2019-5 of 2 September 2019).

After obtaining new opinions from the stakeholders, MOP SSPVO issued a request for reupdating the Environmental Report in letter no. 35409-62/2015/53 of 30 August 2019. Coordination meetings with

line ministries were carried out on the basis of the letter, i.e. the Ministry of Culture (28 August 2019), the Ministry of Agriculture, Forestry and Food, Forestry and Hunting Directorate (9 September 2019) and the Ministry of Health (11 September 2019). Based on agreements that resulted from coordination meetings, the Environmental Report was supplemented in September 2019 and submitted again to line ministries for informal harmonisation. A coordination meeting with the Ministry of Culture took place again (6 December 2019). Informal harmonisation ended in December 2019. On the basis of correspondence with the stakeholders and the coordination meeting with the Ministry of Culture, the Environmental Report was updated again (December 2019), whereby it must be highlighted that deviations occurred regarding the proposed environmental objectives and evaluation criteria provided in the Report “Starting points for drafting the environmental report (Report on defining the scope and content of the strategic environmental assessment)” due to observing the proposals for improving the Environmental Report:

- to discuss forest within natural sources, environmental goal 1: 'Ensure sustainable management of soil and forests', was supplemented;
- indicator to assess impact on environmental goal 10: 'Provide people with a safe supply of wholesome drinking water in sufficient quantities' was amended;
- indicator to assess impact on environmental goal 13: 'Prevent adverse effects on human health from the perspective of EMR and light pollution' was amended;
- indicator to assess impact on cultural heritage was amended;
- indicator to monitor the status of cultural heritage was amended;
- indicator to monitor the status of landscape was amended.

The updated Environmental Report (December 2019) was again submitted to the Ministry of the Environment and Spatial Planning, the Strategic Environmental Assessment Division for consideration.

3. PRESENTATION OF SDSS 2050

3.1 KEY FACTS

The Spatial Development Strategy of Slovenia is a fundamental spatial strategic act of the Republic of Slovenia, which in connection with Slovenia's Development Strategy and other national development acts and EU development objectives, defines basic guidelines of Slovenia's spatial development: the vision, objectives, the concept of spatial development and guidelines for attaining objectives.

Table 2: Key facts about SDSS 2050

Responsibility:	Ministry of the Environment and Spatial Planning
Strategy title:	Spatial Development Strategy of Slovenia 2050
Decision-making procedure:	The proposal is adopted by the National Assembly of the Republic of Slovenia.
Overall objective of SDSS 2050:	Draft a spatial image representing an ideal situation for welfare and well-being of society and the quality of living and natural environment.
Purpose of the renewed SDSS:	The purpose of the process is to obtain consent about development challenges and methods on how to respond to challenges coordinated; what spatial development do we want by 2050, and how to organise the implementation of measures most effectively to obtain the set development objectives.
Subject:	The fundamental long-term spatial development document of the Republic of Slovenia with objectives, priorities and design of spatial development by 2050, which will incorporate challenges of future development of society as the foundation to draft the Action Programme for the Implementation of SDSS.
Planning period:	By 2050.
Area:	The Republic of Slovenia

The Strategy derives from generally accepted values and norms of the Slovenian society written in the Constitution of the Republic of Slovenia and summarises directly from it substantive starting points determining that the state as per constitutional provisions manages a healthy living environment, protects natural and cultural heritage, generates opportunities for citizens to obtain suitable housing, protects land, manages economic, cultural and social progress of citizens living in hill and mountain areas, and local self-government.

Long-term objectives and guidelines of the Strategy pursue and realise fundamental strategic policies and development objectives of Slovenia's Development Strategy 2030 (SDS 2030) (Government of the Republic of Slovenia, December 2017), which placed the objective, 'High-quality of life for all', at the centre of its development efforts. Development objectives: healthy and active life, decent life for all, strengthening of national identity, economic stability, low-carbon circular economy, sustainable management of natural sources, safe and globally responsible Slovenia, are integral starting points also supported by the objectives of spatial development defined in this Strategy.

Due to its position at the crossroads of different geographical areas (Mediterranean, Alpine, Dinaric-Karst and Pannonian), Slovenian territory is exceptionally diverse and variegated. It maintains a relatively high quality of living, and it is attractive because of quality of the environment, natural and

cultural assets, proximity of European economic and cultural centres and good connectivity with European transport networks.

Slovenia's Spatial Development Report (MOP, 2016) providing fundamental findings about the condition of, and trends in, space, which as such presents an expert basis and an accompanying document of the Strategy, forwarded new challenges that significantly impact the state's future spatial development. The Strategy responds to changed international circumstances and social and economic trends, which have spatial and regional effects at the EU level as well as in Slovenia, namely:

- demographic changes;
- climate change including region-specific effects;
- decrease in Slovenia's energy dependency on fossil fuels and a transition to a low-carbon society;
- the globalisation of the economy;
- a new role of towns and cities;
- decreasing nature preservation;
- improved role of integration in cross-border and broader macroregional space.

3.2 COMPLIANCE OF SDSS 2050 WITH THE EU ACQUIS

Since 1986, i.e. from the EU enlargement to include Spain and Portugal, the need to implement cohesion policy programmes, whose objective is to enhance economic and social cohesion in the EU area, has increased substantially. The Treaty of Lisbon and the already adopted EU Strategy (Europe 2020²) introduced the third aspect of cohesion in the EU: territorial cohesion. Measures of the cohesion policy are justified on the basis of Article 174 of the Treaty on the Functioning of the European Union: *the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions.*

To support EU objectives determined in the Europe 2020 Strategy, the ministers responsible for spatial planning and territorial development, adopted new Territorial Agenda of the European Union 2020 (hereinafter: TA2020) in 2011³.

TA2020 was adopted as a political action framework of spatial development supporting territorial cohesion in Europe as a new objective of the European Union (EU) introduced by the Treaty of Lisbon. If the goal of the territorial cohesion is to attain a harmonised and balanced state in Europe, the objective of TA2020 is to provide strategic guidelines for territorial development, promote integration of the territorial dimension in various policies at all governance levels, and ensure the implementation of the Europe 2020 Strategy in compliance with the territorial cohesion principles.

TA2020 emphasises that EU objectives defined in the Europe 2020 Strategy may only be obtained if the territorial dimension of the Strategy is observed, as the possibilities for developing different regions differ. TA2020 provides six territorial priorities for the EU, which may contribute to successful implementation of the Europe 2020 Strategy:

- promotion of polycentric and balanced territorial development;
- promotion of integrated development in towns, rural and special regions;

² Europe 2020 – Strategy for smart, sustainable and inclusive growth COM(2010) 2020, final.

³ Territorial Agenda of the European Union 2020 “Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions” – EU Territorial Agenda 2020; adopted at an informal meeting of ministers competent for spatial and territorial development on 19 May 2011, Gödöllő, Hungary.

- territorial integration in cross-border and transnational functional regions;
- provision of global competitiveness of regions on the basis of strong local economies;
- improve territorial connectivity for individuals, communities and businesses; and
- management and integration of ecological, landscape and cultural assets in regions.

Territorial priorities from TA2020 address the objectives from the Europe 2020 Strategy, which serves as the EU programme for jobs and economic growth in this decade. It is about attaining objectives of smart, sustainable and inclusive economic growth as a method of eliminating structural deficiencies in the European economy to improve its competitiveness and productivity and objectives of sustainable social market economy.

After 2020, cohesion policy will be amended or supplemented. The emphasis on supporting European regions to become more innovative will be significant. Majority of funds from the European Regional Development Fund and the Cohesion Fund will be earmarked for innovations, small business support, digital technologies and industrial modernisation. The funds will also be intended for promotion of the transition to a low-carbon circular economy and to combat climate change, thus realising the Paris Agreement⁴.

The most ambitious programme yet for financing research and innovations in the EU is proposed for the period after 2020, Horizon Europe⁵, which will result in more possibilities for regions to utilise their potential in the field of research and innovations as much as possible.

Due to supplementing cohesion policy after 2020, certain new highlights when defining territorial priorities for the EU may be expected so that their solutions contribute to successful implementation of cohesion policy programmes. Nevertheless, the guidelines for spatial development as defined in TA2020 will more or less remain the same.

SDSS 2050 follows the priority content or guidelines from TA2020.

The objectives of SDSS 2050 and the policies for achieving these objectives refer partly, mostly or fully to promoting polycentric and balanced territorial development, promoting comprehensive development in cities, in the countryside, and in other special regions, spatial/territorial integration in cross-border and transnational functional areas, ensuring global competitiveness of the region, which is based on a strong local economy, better territorial connectivity for individuals, communities, and businesses, and managing and integrating the ecological, natural, and cultural values of a region.

3.3 CONNECTION OF THE STRATEGIC EVALUATION WITH THE ENVIRONMENTAL IMPACT ASSESSMENT

The description of connection between strategic evaluation (SE) and strategic environmental assessment (SEA) is summarised as per the Interim Report (BF, supplemented in June 2017) for the Strategic Evaluation of the Spatial Development Strategy of Slovenia 2030/2050.

The aim of joint production of the strategic evaluation and the strategic environmental assessment is to examine the possibilities for better integration of spatial and environmental content and to obtain a proposal of methodological solutions that would improve such integration.

⁴ EU budget: Regional Development and Cohesion Policy beyond 2020; http://europa.eu/rapid/press-release_IP-18-3885_sl.htm.

⁵ EU budget: Commission proposes most ambitious Research and Innovation programme yet; http://europa.eu/rapid/press-release_IP-18-4041_sl.htm.

Both assessments have several points in common, e.g. ex-ante approach, determining cross-sections based on matrix evaluation procedure and the tendency to optimise the document assessed. They also have several key conceptual (and substantive) differences making them separate entities as per procedures and content. The basic purpose of SE is to contribute to consistency and integrity of SDSS (objectives, guidelines, measures) and to the synergistic relationship between spatial and other policies. The latter is particularly crucial for ensuring spatial cohesion (SC), which is a baseline concept for SC and the drafting of SDSS. Cohesion is the result of balance between individual spatial systems (physical, economic, social) as per their importance, mutual consideration and quality of mutual links (cross-section; Pi-spatial identity, Pk-spatial quality and Pu-spatial efficiency (figure below).

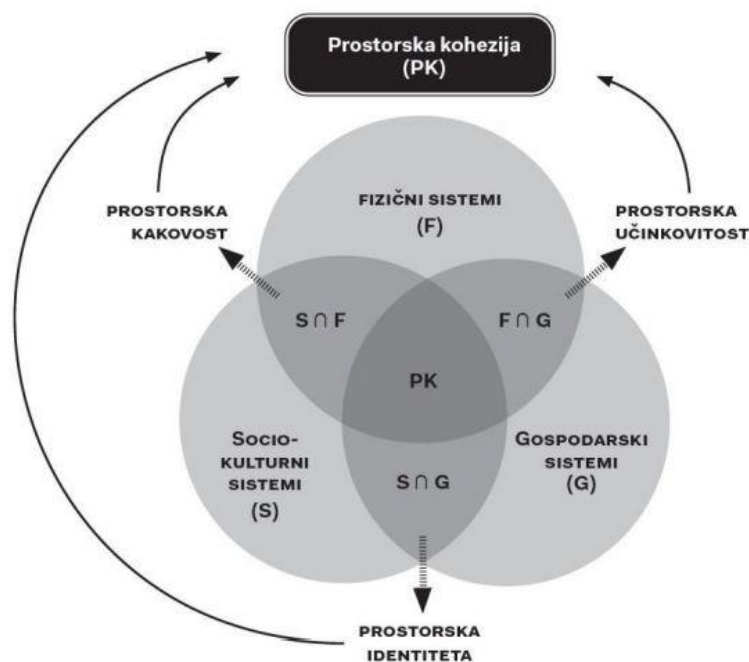


Figure 1: Venn diagram of cross-section presentation of spatial cohesion by Camagni (Camagni, 2007)

Prostorska kohezija (PK)	Spatial cohesion (PK)
Prostorska kakovost	Spatial quality
Prostorska učinkovitost	Spatial efficiency
Fizični sistemi (F)	Physical systems (F)
Socio-kulturni sistemi (S)	Sociocultural systems (S)
Gospodarski sistemi (G)	Economic systems (G)
Prostorska identiteta	Spatial identity

SE and the Environmental Report as the entry document for the SEA procedure identify cross-sectional content whereby solutions for conflictual content is being sought and proposals for synergistic links are formed. SE and SEA ensure that advantage is given in SDSS to such resolving of conflicts and dilemmas in spatial development (activities, measures) which have proven more (synergistically) cross-sectional. In particular, these are multifunctional spatial alternatives that improve the utilisation of spatial potentials, or in the case of the environment, those that simultaneously contribute to the realisation of environmental objectives. SEA resolves conflict cross-sections with mitigation measures. Spatial cohesion thus requires that the environment remains an entity with its own integrity and cannot (must not) be fully integrated with the social and/or economic

system. There is no need for complete integration even in the institutional (procedural) sense since these are two separate fields with their own governance structure and intervention logic⁶.

The cross-section method is used for strategic evaluation, determining the scope and type of links between spatial and other policies (external compliance) and between measures and objectives of the spatial policy (internal compliance). It is being determined whether the nature of these connections is synergistic (+) or potentially conflicting (-), and to what pillar of spatial cohesion they contribute (identity, quality, efficiency).

The prescribed methodology is used in the Environmental Report, which is required in compliance with the applicable legislation for strategic environmental assessments (SEA). The strategic significance of SEA or the Environmental Report is ensured with links to SE. Both approaches (SE in SEA) cover comprehensively the ratio between space and the environment at all levels and in both directions.

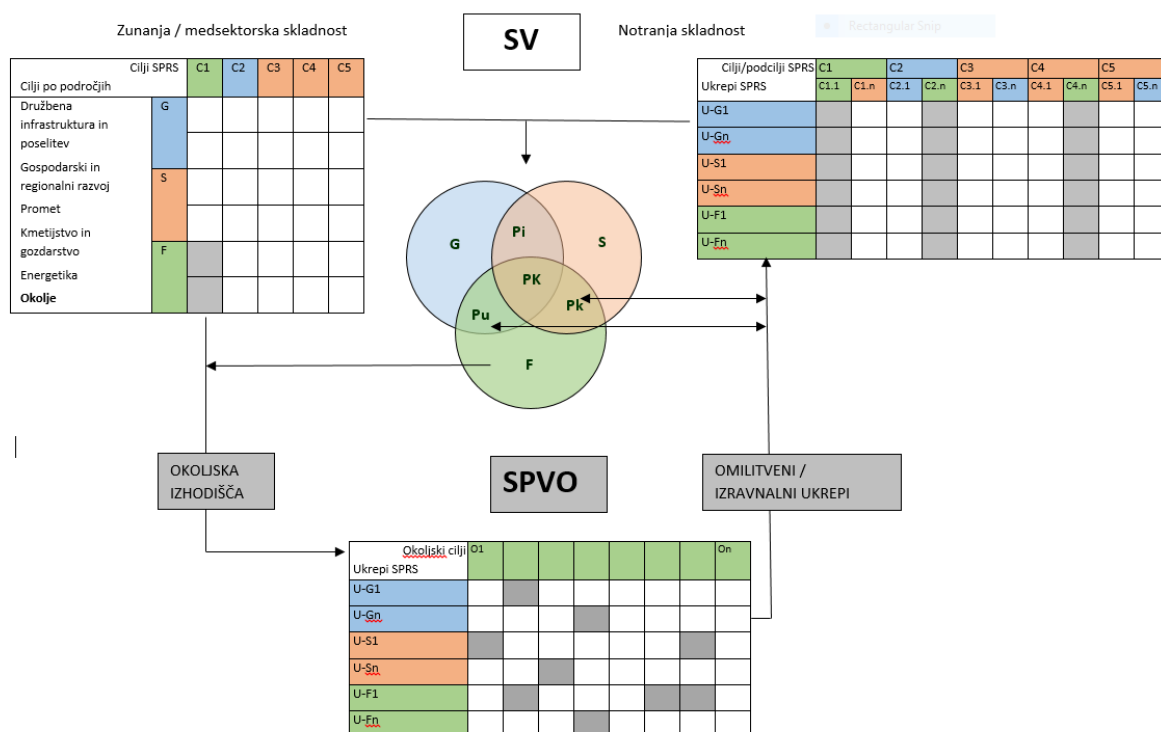


Figure 2: Both approaches and connections between SE and SEA

Zunanja/medsektorska skladnost	External/cross-sectoral coherence
Cilji SPRS	SDSS objectives
Cilji po področjih	Objectives by fields
Družbena infrastruktura in poselitev	Social infrastructure and residential development
Gospodarski in regionalni razvoj	Economic and regional development
Promet	Transport
Kmetijstvo in gozdarstvo	Agriculture and forestry

⁶ Intervention logic is the concept explaining the internal cause-effect mechanism of public policy functioning (spatial planning operators by means of its explanation clarify how they connect their instruments with solutions and on what logical basis this is done in a particular way).

Energetika	Energy
Okolje	Environment

Notranja skladnost	Internal coherence
Cilji/podcilji SPRS	SDSS objectives/sub-objectives
Ukrepi SPRS	SDSS measures

Okoljska izhodišča	Environmental starting points
SPVO	SEA
Omilitveni/izravnalni ukrepi	Mitigation/compensatory measures
Okoljski cilji	Environmental objectives
Ukrepi SPRS	SDSS measures

External compliance is assessed in SE at the level of policies' objectives; five general objectives as determined in this phase of SDSS and objectives of key fields (sectoral policies) as defined in strategic documents. The matrix was prepared for each discussed field; example for the environment is displayed below. Due to a comprehensive discussion, a compliance assessment at the level of measures was not possible in SE, which would enable the identification of conflicts or synergies with greater certainty and level of concreteness. This may be done within SEA for the field of the environment.

Table 3: Assessment matrix of mutual impact of objectives in the fields of the environment and spatial development

		F	G	S		
	SDSS environment	C1	C2	C3	C4	C5
F	O2	+	+	+	+	+
	O3	+	+	+	+	+
	O5	+	+	+	+	+
	O6	-	-	+	+	+
	O11	+	+	+	+	+
G	O1	+	+	+	+	+
S	O4	+	+	+	+	+
	O7	+	+	+	o	+
	O8	+	+	+	+	+
	O9	+	+	+	+	+
	O10	+	+	+	+	o

The above table and its correlation variants⁷ (assessment matrix of mutual impact of objectives in the field of transport, sustainable mobility and spatial development, the field of agriculture, forestry, fisheries and spatial development, and the field of energy, mining and spatial development) are starting points for assessing environmental impacts since they point to (potentially) conflictual ratios between space and the environment. Within SE, the majority of objectives were assessed as compliant

⁷ Tables P4.8 – P4.10 in Appendix 4 in the Strategic Evaluation of the Spatial Development Strategy of Slovenia 2030/2050, Interim Report, supplemented in June 2017 (Biotechnical Faculty).

or even synergistic in the fields of the environment and space. The ratios between the objective referring to preservation of integrity of preserved areas, rational spatial development and development of (competitiveness) cities were revealed as (potentially) conflicting. Measures for maintaining the integrity of preserved areas may be difficult to implement because they are spatially extensive, and in certain cases observe strict protection regimes or involve lengthy and complicated procedures with uncertain results.

3.4 OBJECTIVES OF SDSS 2050

Objectives of Spatial Development Strategy of Slovenia 2050 are defined while taking into consideration the bases for spatial development, key future challenges, policies of documents at the global and European levels, and bases for national public policies with identified impacts on spatial development.

The Strategy defines five strategic objectives of spatial development, i.e.:

Strategic objective 1: A rational and effective spatial development

Spatial development creates the conditions for achieving spatial equity and spatial cohesion in the territory of Slovenia, which is based on the rational organisation of activities in space and the equipment of centres, accessibility, effective use of spatial potentials while taking into account limitations in space, and cohesion between all parts of Slovenia.

With even and thoughtful arrangement of centres of the polycentric urban system, effective and suitable accessibility of citizens and businesses to services and care is attained in the entire territory of Slovenia. In cooperation with the state, regional stakeholders, local communities, business representatives, NGOs and citizens, the processes of coordinated resolving of key spatial, environmental, business and social problems are established in broader urban areas, other areas of functional integration, and areas of development regions. The regional development refers to those spatial potentials and sources, which upon their viable and sustainable use support the business sector and social development, enhance resilience to climate change, reduce vulnerability of space, and strengthen national and regional identity. The development based on regional spatial potentials and sources generates conditions for increased employability in the local environment, does not increase daily commuting between municipalities or depopulation.

Priorities for attaining the objective:

P1: Improve efficient use of spatial potentials while observing spatial constraints

- promote drafting and implementation of integral development visions based on spatial potentials and while observing spatial constraints. By implementing development visions, synergies between sectoral policies and their measures in concrete areas (within the framework of regional spatial plans) are being attained;
- integral planning of settlements, transport system, public infrastructure and green infrastructure;
- promote the transition to material, energy and spatial efficiency by means of: enhancing the use of secondary sources in the business sector to reduce pressure on opening new areas for the use of natural sources; attaining energy efficiency at the level of buildings, neighbourhoods and settlements within comprehensive (functional) renovation; promoting cascading use of energy (use of surplus energy generated during heating or cooling by another user) and industrial symbiosis or the principles of circular economy and other innovative and environmentally acceptable approaches when developing smart cities and communities;
- achieving such forms of settlement concentration that enable a balance between built-up, open public and green surfaces for the quality of living and adjusting to climate change;
- promote the reuse of degraded land in urban areas;
- promote the establishment of a community approach to energy supply, particularly in rural areas.

P2: Ensure suitable access to services of general interest to support the development of different types of areas

- cross-sectoral and multi-level coordinated implementation of measures to ensure suitable level of equipment of centres in the polycentric urban system;
- cross-sectoral and multi-level integration to develop innovative service models for remote mountain and border regions, which support rural population and vitality of rural areas.

Strategic objective 2: Competitiveness of Slovenian towns/cities

The development role of towns, cities and centres in a polycentric urban system is being enhanced, both within the national framework as well as in cross-border and international integration processes. This way, cities contribute to the economic, social, and societal development of the country.

Slovenian towns at the crossroads of three European macro-regions, i.e. the Alpine, the Danube and the Adriatic-Ionian, are integrated well in the European transport corridors. Towns situated at the intersection of transport corridors function as transport hubs. Key gateways and connections with them have to be enhanced and thus exploit locational advantages for the country's development. Therefore, maintaining high quality of the environment and landscape. Gateways must be connected with the most important urban hubs, large European cities and metropolitan areas. The role of urban areas near a border must be enhanced, particularly by means of qualitative and diverse functions and infrastructure, which will enable their equal role and also the assumption of a leading role in spatial development at the cross-border level.

Urban settlements will focus (restructure) on the development of specific fields arising from their comparative advantages, particularly in location and infrastructure, service supply, access to governance functions at the highest level, availability of work force and skills, quality of the living environment and cultural heritage, proximity to the rural hinterland. Their role in the country's development will be upgraded with a planned and coordinated development in broader urban areas and other areas of functional integration within which comparable critical mass in infrastructure supply and service offer, the scope of work force and other key fields will be obtained by connecting and supporting small urban settlements. Within broader urban areas and other areas of functional integration, line ministries, development regions, town municipalities and other local communities will agree on managing urban development, particularly on arranging locations for business activities (jobs), providing housing, integration of sustainable mobility systems, quality and reliable supply of green energy and other sources, supply and access to services, living quality standards arising from the quality of the environment and landscape, methods and instruments of implementing and ensuring funding sources for projects, important for the development of broader urban areas and other areas of functional integration.

Priorities for attaining the objective:

P3: Functional integration and comprehensive urban management

- promote functional integration and strategic planning within broader urban areas and other areas of functional integration with rural areas;
- promote comprehensive urban management by integrating economic, environmental, design, functional, technical and technological aspects.

P4: Enhance Slovenian cities/towns internationally

- establish intermodal transport hubs for passenger and goods transport in centres of the polycentric urban system relating to infrastructure that enables integration of towns in international flows;
- enhance cities/gateways and urban border areas in the state's development strategies, particularly in transport, educational, health, business, housing and environmental ones.

P5: Improve locational attraction of cities/towns

- design cities into spaces of interaction, innovation, culture, community integration and social cohesion;
- develop working environments and support services to draw in work force and their family members from abroad, such as education, networking, international schools, cultural services;
- draft measures (fiscal, etc.), renew and reactivate poorly utilised or degraded areas;
- ensure safe and healthy living environment by adjusting cities to climate change;
- provide possibilities for healthy lifestyle in cities by establishing quality public space and green and sustainable mobility systems in cities.

Strategic objective 3: High-quality life in urban and rural areas

We wish to create compact, attractive, healthy, and safe towns and cities and other settlements for living, working, creating, and enjoying leisure and to improve the sustainable approach to managing energy, water, air, and soil within a comprehensive management system in cities and other settlements.

Small and medium-sized towns are typical of Slovenia. In order to reduce the trend of suburbanisation and improve management of daily commuting in broader urban areas and other functionally integrated areas, the attractiveness of towns for quality living, working and leisure time for different age groups is enhanced. Towns will be redesigned into spaces of interaction, innovation, culture, and community integration where spaces for living, working and leisure time are functionally intertwined and integrated with the surrounding area and landscape. Compactness of towns will be enhanced, whereby attention will be directed towards suitable forms of concentration and preservation of public and green surfaces as the buffers of climate change impact and better quality of living in towns. Sustainable mobility is the basic concept of comfortable, efficient, healthy and environmentally-friendly accessibility in towns that must be enhanced. Towns are great consumers of energy and natural sources, which is why the needs must be levelled by introducing solutions of circular economy and integrate them in comprehensive renovation and construction at the level of buildings, districts and neighbourhoods. Good architecture and well-designed and maintained public premises, green systems and well-incorporated cultural heritage will contribute to greater attractiveness of towns. Expert-supported interdisciplinary planning of urban space will be enhanced and the excellence of urban management compliant with their role in Slovenia's development will be promoted. In the process of restructuring, rural settlements will coordinate their needs for living, working and development of primary activities and thus related supplementary activities. Improved functionality of rural settlements that preserves tradition, cultural heritage and integration in the mosaic of cultural and natural landscape will enhance the attractiveness of rural areas as destinations interesting for the development of tourist programmes. The housing function will not be enhanced in rural settlements, which would transform them into dormitory towns.

Priorities for attaining the objective:

P6: Increase attractiveness of cities for living

- design cities into spaces of interaction, innovation, culture, community integration and sustainable development;
- provide high-quality and accessible housing for different groups of citizens;
- enhanced concern for equipment and intertwining of complementary uses in urban areas in access radius by means of sustainable mobility;
- improve quality and diversity of open public and green surfaces in cities, and accessibility to cities' green systems and through them to green system of regions.

P7: Implementation of comprehensive functional renovation of settlements

- enhance integral approach when planning, arranging and managing settlements by integrating economic, social, cultural, design, technical, technological and environmental aspects;
- promote settlement concentration in a balanced relationship with open and green surfaces within the framework of adjusting to climate change;
- revitalise and re-urbanise poorly utilised or degraded areas by integrating sustainable mobility, circular economy, energy efficiency and self-sufficiency.

P8: Improve vitality and attractiveness of rural areas

- enhance renovation and reactivation of poorly utilised or degraded areas in rural settlements primarily for agricultural and other (supplementary) activities that enable an increase in local employment and reduce daily commuting to towns;
- reduce negative impact of agricultural activities on the quality of living in settlements;
- improve spatial possibilities for the development of agricultural holdings in rural settlements and villages;
- ensure environmentally suitable and affordable forms of municipal infrastructure in rural settlements;
- ensure the development of sustainable forms of mobility in rural areas relating to regional mobility systems to improve access to services;
- enhance integration between towns and rural areas for the supply of food produced locally as an element of modern urban management and design.

Strategic objective 4: Enhance spatial identity and multifunctionality of space

Key spatial identity elements, which consist of valuable natural features and biodiversity, cultural heritage, and landscape, are being preserved and developed. Their prudent inclusion into economic and social development contributes to Slovenia's improved reputation as a well-maintained, attractive, creative, healthy, and green country.

Spatial identity is made up of natural, landscape and built-up structures, which stand out due to their properties, structure, position, cultural and symbolic value. Slovenia is known for many naturally preserved areas, exceptional natural features, cultural heritage, and a rich and diverse mosaic of cultural landscape. The most valuable parts are protected according to the regulations on conservation of nature and cultural heritage. Management of space and its elements outside protected areas is also important for spatial identity, which is why we want to enhance the preservation of spatial identity in protected areas on the one hand, and on the other, ensure that parts of space outside these areas that are important for the identity are also preserved. Spatial identity will be recognised and granted a special place in all public policies, documents and educational programmes in order to enhance values, relationship towards space, historical development and homeland, and it will be included as a potential for creativity, development and quality of the living space.

We will strive to attain multifunctionality in space, particularly in those fields where this could contribute to improved resilience of space and mitigate harmful impacts of natural disasters. In projects that change spatial relationships and thus affect spatial identity or multifunctionality, concern for their siting, preservation of ecological connectivity and high-quality architecture will be enhanced. At all levels of planning, we will enhance our efforts that the modern development of society contributes to creating spatial order, preserving recognisability of nature and cultural heritage and harmonic image of the landscape.

Priorities for attaining the objective:

P9: Recognise and incorporate spatial identity in development policies and spatial documents at all levels

- Enhance restoration of cultural heritage in urban and rural areas, and its integration in the development of these areas;
- maintain and establish recognisability of rural cultural landscape, particularly the mosaic intertwining of rural settlements and villages and agricultural and forest landscape;
- increase concern to adjust infrastructural and other large systems in order to preserve settlement and landscape recognisability, and ecological connectivity;
- encourage sectors to incorporate spatial identity, particularly cultural diversity (heritage), biodiversity and landscape diversity in their development documents;
- promote the inclusion of spatial identity and settlement and landscape recognisability in spatial development planning at the regional and local levels.

P10: Establish and implement integral instruments to support long-term enhancement of spatial identity

- Implement architectural policies, particularly public urban, architectural and landscape-architectural calls for facilities funded from public funds;
- adopt and implement landscape policies, particularly in areas of landscape visibility and measures for their preservation;
- promote sustainable construction and renovation;
- form instruments and approaches for comprehensive preservation of spatial identity and settlement and landscape visibility in natural parks, protected areas of cultural heritage and towns.

P11: Improve awareness on the importance of spatial identity and ways of incorporating it into the development

- Enhance sensitivity of the public media space for the issue of spatial identity;
- introduce education on spatial identity and ways of incorporating it into the development;
- promote good practices.

Strategic objective 5: Resistance of space and adaptability to change

The level of qualification of administration workers and decision-makers regarding the timely recognition of changes which affect spatial development opportunities and regarding the mobilisation of the necessary resources and participatory processes for expert-supported and socially acceptable decisions and measures is being enhanced.

Numerous external and internal circumstances, including social and natural, affect the space. Spatial planning policy must establish a management structure that would not conduct only the drafting of spatial acts, but will enhance an informed decision-making on spatial development supported by spatial facts, and the integrating role of space at all levels. It is necessary to enhance the ability to detect problems and challenges with spatial effect, analytical evaluation, and to ensure timely action. Suitable fundamental and applied research must be supported. Strategic spatial planning at all levels must be enhanced, which is incorporated in European and global flows, and linked with sectoral policies, and which promotes enhancing of synergies in space and builds on spatial potentials, and the attainment of multi-functional solutions. Attention is dedicated to the transfer of experience and knowledge between levels and line ministries, experts and politics. The development of active citizenship will be promoted, which will provide possibilities to change habits in order to support the implementation of spatial policy and sustainable development.

Priorities for attaining the objective:

P12: Improve resilience of space

- Enhance multi-functional approach, particularly in the areas and fields where synergies in space may be achieved when integrating sectoral policies;
- enhance concern for reducing vulnerability of space and the exposure of people and infrastructure to risks of danger;
- establish and manage the system of green infrastructure at various levels in connection with green systems of regions and settlements and areas in broader space.

P13: Enhance the ability to detect problems and challenges and recognise their effects in space

- Enhance analytical support in decision-making about spatial development, i.e. fundamental, applied, targeted and interdisciplinary research and expert bases, and indicators for monitoring the status of spatial development;
- increase sensitivity of public administration for challenges on various fields and the ability for innovative integration of strategic planning by forming suitable measures and monitoring the effects;
- establish and implement integrated assessing of effects on space.

P14: Enhance professional competence and raise awareness about space and the role of spatial planning

- Develop instruments for attaining the spatial cohesion objectives;
- raise awareness about space, particularly about recognising the role of space and the system of spatial planning at various levels for preserving the identity and development of the country;
- enhance competences of spatial planners;
- enhance the exchange of knowledge and experience between stakeholders at all levels;
- ongoing training for active citizenship in the field of spatial development and planning.

3.5 DESCRIPTION OF SDSS 2050

CONCEPT OF SPATIAL DEVELOPMENT

The concept of spatial development supports the enhancement of internal spatial cohesion in the country, Slovenia's developmental inclusion in Europe, and macro-regional integrations. It is a strategic framework for connecting spatial systems and structures, by way of which the vision and the goals of spatial development are fulfilled. The concept was developed on the basis of the simultaneous, synergistic, integral, and interdependent development of three spatial systems: (1) settlement, (2) public infrastructure, and (3) and green infrastructure. When planning and developing these systems, social, economic, and environmental development aspects as well as the justified needs of individual specific areas are taken into account.

The concept of spatial development consists of the following elements:

- development corridors and entry points,
- a polycentric urban system with centres and broader urban areas,
- rural areas,
- green infrastructure.

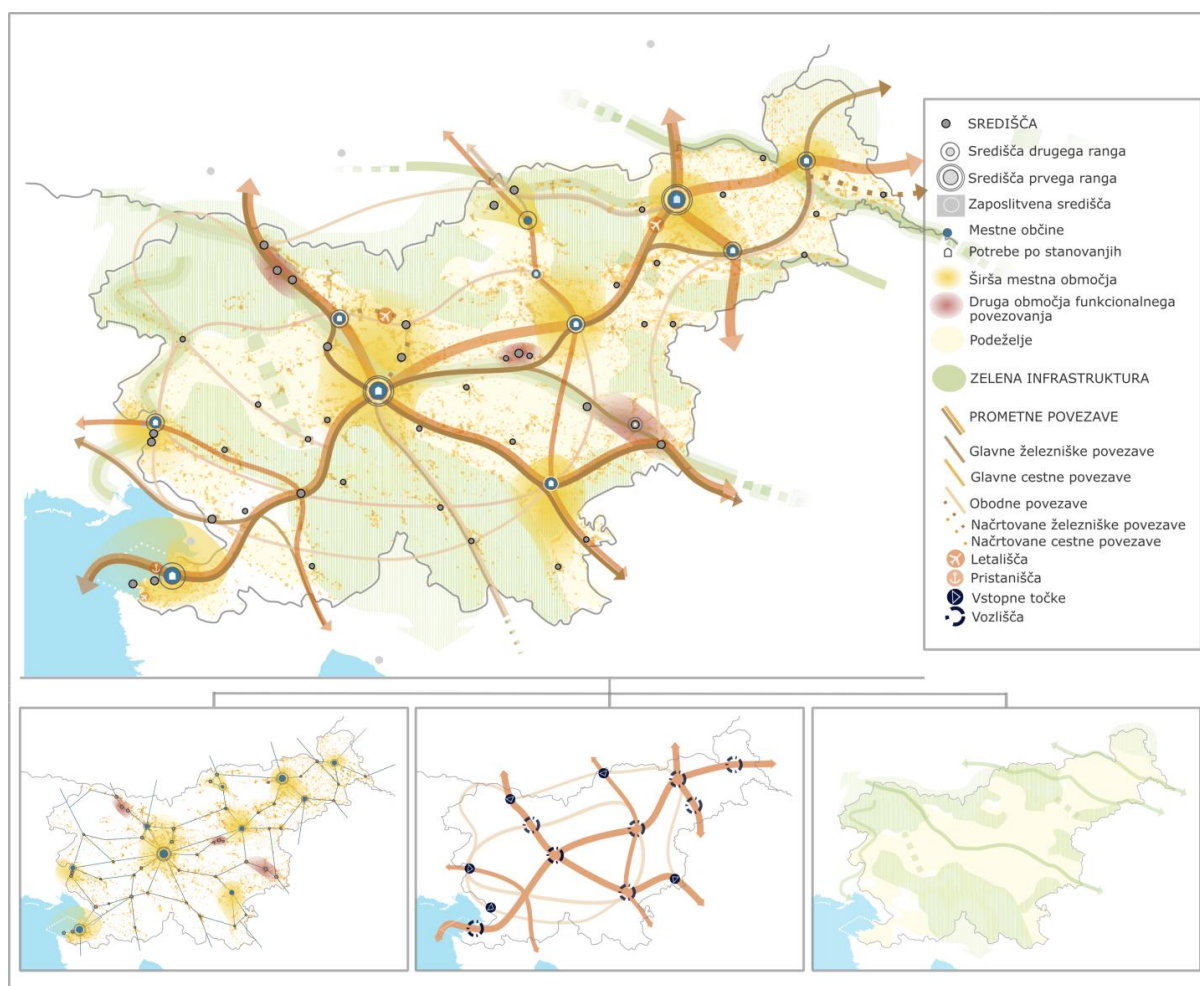


Figure 3: Integration of a polycentric urban system, transport infrastructure, and green infrastructure into the concept of the spatial development of Slovenia (source: MOP, 2019)

Središče	Centre
Središča drugega ranga	Second-rank centres
Središča prvega ranga	First-rank centres
Zaposlitvena središča	Employment centres
Mestne občine	City municipalities
Potrebe po stanovanjih	Housing demand
Širša mestna območja	Wider urban areas
Druga območja funkcionalnega povezovanja	Other areas for functional integration
Podeželje	Rural areas
Zelena infrastruktura	Green infrastructure
Prometne povezave	Transport connections
Glavne železniške povezave	Main rail connections
Glavne cestne povezave	Main road connections
Obodne povezave	Peripheral connections
Načrtovane železniške povezave	Planned rail connections
Načrtovane cestne povezave	Planned road connections
Letališča	Airports
Pristanišča	Ports
Vstopne točke	Entry points
Vozlišča	Hubs

The concept of spatial development:

- follows the principles of polycentric development and the rational organisation of activities in space; by supporting the development of several centres in a polycentric urban system, the rational organisation of activities in space, equal access to the services of general significance and to public infrastructure in the entire area of the country, and the improvement of living quality are ensured;
- supports the strengthening of the competitive power of towns and urban centres, while, at the same time, cooperation and the provision of functional connections and interactions between the urban centres, settlements within broader urban areas and other areas with functional integrations, and in rural settlements ensure the balance of the conditions for development in various areas and enable the combating of the negative effects of remoteness;
- pays special attention to remote and border areas, away from the centres at levels I, II, or III and from traffic flows, and to mountain areas where development opportunities are limited due to elevation and relief;
- encourages local communities to cooperate and complement each other beyond administrative limits and promotes a greater connection between the development of areas and spatial potentials (spatial specialisation).

1.2.1

2.2.1

3.2.1

4.2.1

5.2.1

6.2.1

GUIDELINES FOR ACHIEVING OBJECTIVES AND CARRYING OUT THE SPATIAL DEVELOPMENT CONCEPT

To attain objectives and the implementation of the spatial development concept, SDSS 2050 determines three sets of guidelines (instruments or measures) for long-term spatial development at national, regional and local levels, i.e.:

1st set of guidelines - general guidelines for spatial development:

- 1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS,
- 1.2 GUIDELINES FOR URBAN DEVELOPMENT,
- 1.3 GUIDELINES FOR RURAL DEVELOPMENT,
- 1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS,
- 1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS,

2nd set of guidelines - guidelines for developing/drafting public policies:

- 2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE,
- 2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY,
- 2.3 GUIDELINES FOR ENERGY NETWORKS,
- 2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS,
- 2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES,
- 2.6 GUIDELINES FOR NATURE CONSERVATION,
- 2.7 GUIDELINES FOR TOURISM DEVELOPMENT,
- 2.8 GUIDELINES FOR DEFENCE ACTIVITIES,
- 2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS,

3rd set of guidelines - guidelines for managing, integrating and implementing the Strategy:

- 3.1 INSTRUMENTS FOR ENFORCING TERRITORIAL COHESION,
- 3.2 SPATIAL INSTRUMENTS,
- 3.3 GUIDELINES FOR INTEGRATION BETWEEN OTHER (SECTORAL) AND SPATIAL INSTRUMENTS,
- 3.4 GUIDELINES FOR MANAGEMENT MEASURES,
- 3.5 GUIDELINES FOR DETERMINING THAT DEVELOPMENT DOCUMENTS OF INDIVIDUAL FIELDS AND ACTIVITIES ARE NOT CONTRARY TO THE STRATEGY,
- 3.6 MEASURES FOR ENHANCING PROFESSIONAL COMPETENCE,
- 3.7 GUIDELINES FOR ORGANISATIONS AND WORKING BODIES TO SUPPORT DECISION-MAKING.

Description of the 1st set of guidelines - general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS include general guidelines for settlements and their development and planning, guidelines for rural settlements in the area of broader urban areas and other areas of functional integration, and guidelines for settlements with areas determined for long-term development.

1.2 GUIDELINES FOR URBAN DEVELOPMENT encompass general guidelines for the development of cities and other urban settlements, broader urban areas, and development corridors.

1.3 GUIDELINES FOR RURAL DEVELOPMENT include guidelines for managing resources and the development of activities in rural areas.

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS encompass general guidelines for preserving and improving biodiversity, the recognisability of the landscape, improving ecological connectivity, and reducing the vulnerability of space.

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS include guidelines for areas with specific characteristics, location, or importance, which require comprehensive intersectoral preparation, simultaneous implementation of public policies, and a coordinated multi-level approach.

Guidelines for the sea and the coast encompass guidelines for the development of activities at sea or on the coast, as a foundation for devising a maritime spatial plan and establishing integral coastal management.

The guidelines for special areas incorporate spatial guidelines for the transition to a low-carbon society, and guidelines for areas with special development potentials (e.g. tourist, protected areas or recognised landscape areas).

Description of the 2nd set of guidelines - guidelines for developing public policies

Guidelines for the development of public policies include guidelines for devising public policies in support of spatial development and for achieving synergistic effects of the implementation of public policies in space, i.e.:

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE include guidelines for developing transport infrastructure and services on it, which supports the development of the polycentric urban system and inclusion of the state in international transport flows. Guidelines included in this group address specifically:

- development of corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, and develops in accordance with the polycentric urban system in Slovenia;

- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling, use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes which connect urban centres and tourist settlements, and are connected to the long-distance European cycling connections which run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics) which are connected to centres at levels I and II or to wider urban areas and other areas with functional connections;
- planning of transport infrastructure so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY refer to the development of energy supply, which is one of key needs of the business sector and the community in urban and rural areas. The state must ensure reliable, fair and affordable supply. Guidelines included in this group address specifically:

- priority use of renewable energy sources,
- spatial possibilities to increase the share of renewable energy sources,
- spatial possibilities and limitations for sustainable use of wind power,
- suitability of exploiting geothermal energy and ambient heat,
- priority promotion of the energy utilisation of biomass, and
- priority modes of utilising solar energy.

2.3 GUIDELINES FOR ENERGY NETWORKS refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS refer to the long-term supply of economically significant and indigenous mineral raw materials to the state. The utilisation of indigenous mineral raw materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant mineral raw materials primarily refers to the utilisation of mineral raw materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of mineral raw materials in construction is expected to be reduced.

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

2.6 GUIDELINES FOR NATURE CONSERVATION refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features, and harmonised implementation of protection objectives in the existing protected areas and establishing new wider protected areas.

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

2.8 GUIDELINES FOR DEFENCE ACTIVITIES refer to the adjustment of the existing military infrastructure to new needs, provision of suitable military infrastructure and its distribution in space, and the preservation of the primary use of areas with strategic significance for defence of the state.

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS refer to seismic-prone areas, areas that have already been affected by natural disasters, areas at risk due to the possibility of collapsing of dams, and direct spatial development outside risk areas.

Description of the 3rd set of guidelines – guidelines for managing, integrating and implementing the Strategy

Guidelines for spatial management, integrating and implementing the Strategy include guidelines for inter-sectoral integration and cooperation between levels and sectors as a foundation for the coordinated implementation of the Strategy at the state, regional, and local levels, guidelines for combating potential spatial conflicts and achieving synergies at various levels of spatial development, and guidelines for assessing the compliance of public policies with the Strategy.

Since environmental impact caused by the implementation of guidelines from **the 3rd set of guidelines** (guidelines for managing, integrating and implementing the Strategy) **is indirect** and has already been **included in assessments of environmental impact** resulting from the implementation of guidelines from the first and second sets of SDSS 2050 guidelines, the impact caused by the implementation of these guidelines is not particularly highlighted in this Environmental Report.

3.6 PERIOD OF IMPLEMENTATION

The basic guidelines are drafted for the long-term perspective until 2050. An action programme for the period up to 2030 will be devised for implementing the objectives of the Strategy in the medium-term with activities, operators, deadlines, and funds defined in greater detail.

4. STATE OF THE ENVIRONMENT IN SLOVENIA

The table below displays available information for defining the status of the environment from the registries of the environment information system and registries and other databases established by state bodies. The data from the relevant registries were used when describing the status of the environment.

An analysis of the existing state for the fields of the environment was made in what follows, and on the basis of impact identification it was established that the implementation of SDSS 2050 could have a significant impact on them.

Table 4: Databases on the state of the environment and existing environmental burdens

Name of database, source of data	Database manager	Clarifications
Environmental Atlas (http://gis.arso.gov.si/atlasokolja)	Ministry of the Environment and Spatial Planning, ARSO	The Environmental Atlas of Slovenia is a web application which provides insight into spatial information for Slovenia by means of an internet browser. By means of the Atlas, the Slovenian Environment Agency (ARSO) provides insight into environmental spatial content to the widest circle of users.
Geoportal ARSO http://gis.arso.gov.si/geoportal/catalog/main/home.page	Ministry of the Environment and Spatial Planning, ARSO	Geoportal ARSO is intended for browsing, searching and downloading data layers of environmental spatial content. The data refer to the layers which fall under the competence of ARSO and is available in the Environmental Atlas.
Water Atlas https://gisportal.gov.si/portal/apps/webappviewer/index.html?id=11785b60acdf4f599157f33aac8556a6	Ministry of the Environment and Spatial Planning, DRSV	The Water Atlas is a web application which with the use of an internet browser enables an insight into the content relating to water, which was drafted within the framework of implementing the Community acquis in Slovenia (water (WFD), flood (FD) and marine (MSFD) directives).
Nature Conservation Atlas (http://www.naravovarstveni-atlas.si/nvajavni/)	Ministry of the Environment and Spatial Planning, ARSO	The Nature Conservation Atlas is a web application that displays detailed content from the field of preservation of biodiversity and protection of natural assets in Slovenia.
State of the environment in Slovenia http://www.arso.gov.si/	Ministry of the Environment and Spatial Planning, ARSO	The report on the environment is drafted by the ministry responsible for the environment, in cooperation with other ministries, every four years. It covers primarily the period from the last similar report. The report considers data and analyses which are available during the drafting of the report. The report is used for the purposes of assessing environmental policies in the recent period and as the expert basis for the preparation of the next strategic documents.
Landscape areas with distinctive features at the national level	Ministry of the Environment and Spatial Planning	The areas are defined by the Spatial Development Strategy of Slovenia. These are areas important at the national level which include distinctive and representative parts of the Slovenian landscape with well-preserved landscape components.
Exceptional landscapes	Ministry of the Environment and Spatial Planning	Exceptional landscapes are landscape areas of special value on specific territories that are characteristic of these territories. These are usually small areas created as a result of the traditional, in most cases agricultural use of space, consistent with the natural landscape structure and natural processes.
Registry of Immovable	Ministry of Culture,	The official database on immovable cultural heritage in

Cultural Heritage (RKD) http://giskd.situla.org/	INDOK Centre	Slovenia. Data from the registry is also available in the form of legal arrangements for the protection of heritage for the needs of spatial planning and interventions.
Actual use http://rkg.gov.si/GERK/	Ministry of Agriculture, Forestry and Food	The actual use was established on the basis of interpretation of aerial images (DOF) for the purposes of administrative control and producing a permanent plant register (vineyards, orchards, hop fields and olive groves). This is a typological distribution of the type of use considering the state of actual use when capturing the data, and separates the categories of use, such as built and similar land, agricultural land, forests, water bodies, etc.
Soil potential index http://rkg.gov.si/GERK/	Ministry of Agriculture, Forestry and Food	Soil potential index presents the capability of agricultural land to produce crops and is determined with soil properties of permanent character. The basic parameters to calculate the soil potential index include soil texture, soil development level, parent material and water conditions. The calculated soil potential index is independent from the current type of use (field, meadow, orchard, vineyard, forest) and shows only the potential of the land to produce crops. It is possible to differentiate in more detail when observing other factors, such as data on the climate, DTM (digital terrain model) and others.
Statistical data http://www.stat.si/statweb	Statistical Office of the Republic of Slovenia	The Statistical Office of the Republic of Slovenia carries out statistics, statistical analyses and data processing in the Republic of Slovenia. The Office provides prompt data on the state and movements in economic, demographic and social fields as well as in the field of the environment and natural resources.

4.1 NATURAL RESOURCES

4.1.1. SOIL

Soil is forming the top layer of the earth's crust situated between the bedrock and the surface, excluding groundwater as defined in Article 2(2) of Water Framework Directive 2000/60/EC⁸. Soil is essentially a non-renewable resource due to the very long period needed for its formation.

Soil is an important natural resource enabling the emergence/existence of land ecosystems. High-quality soil or area with fertile soil and suitable climate is a valuable natural asset. Soil enables human survival, and also affects the development of other human activities (including development of industry, art, culture, etc.). In the past, soil was assessed particularly through its function of producing biomass, which includes production of food (in agriculture) or biomass (in forestry). In addition to this key function for the production of biomass, soil also implements the following environmental functions essential for sustainable development:

- provide habitats for underground and surface biodiversity,
- filter and direct water flow to aquifers,
- bind and transform pollutants,
- retain and bind atmospheric CO₂,
- reduce the frequency of floods and drought and their risks,
- provide physical and cultural environment for people and human activities,

⁸ As per the definition from Proposal for a Directive establishing a framework for the protection of soil (COM(2006) 232 final) and Thematic Strategy for Soil Protection COM(2006) 231 final.

- help balance micro-climate in built-up urban areas, particularly when enabling plant growth, and
- provide aesthetic functions of the landscape.

The degradation of soil involves reduction of the ability to implement at least one essential environmental soil function. Soil degradation is usually the result of construction. The upper layer of soil, which ensures majority of ecosystem services related to soil, is usually removed in the procedure of construction. Strong foundations/load-bearing elements carrying the weight of the building and physically supporting it, and infrastructure, are installed in the lower layer of soil and/or parent material. In this way, soil is usually separated from the atmosphere, which prevents the infiltration of rainwater and the exchange of gases between soil and air. Construction also causes direct loss of fertile soil if this is not suitably and again used somewhere else. The latter is worrying due to the very slow process of soil formation (pedogenesis) since it takes several centuries for one centimetre of fertile soil to be made.

Current conditions and trends of soil degradation due to construction

Some 75% of European citizens currently live in urban areas, whereby it is estimated that this percent will increase by 2020 by 80%⁹. The total surface of cities in the EU has increased since the mid-1950s by 78%, while the population increased only by 33%¹⁰. Present-day European areas defined as 'suburban' have the same volume of built-up land as urban areas, although the density of population is halved¹¹.

Due to changing social and environmental challenges caused by soil degradation, standardised data of the Land use and land cover survey (LUCAS) have been available in the European Union since 2006. These include indicators of increasing artificial land, soil degradation and impact of agriculture on the environment, which are important for planning mitigation measures for these impacts.

As per the rules of statistical survey LUCAS,¹² artificial land comprises the area of land used for housing, industrial and commercial purposes, health care, education, nursing infrastructure, roads and rail networks, recreation (parks and sports grounds). In land use planning, it usually corresponds to all land uses beyond agriculture, semi-natural areas, forestry, and water bodies. As per the statistical survey LUCAS, soil sealing means the permanent covering of an area of land and its soil by impermeable artificial material (e.g. asphalt and concrete), for example through buildings and roads. Only part of artificial land is actually sealed, as gardens, urban parks and other green spaces are not covered by an impervious surface.

The results of statistical survey LUCAS show in the graphs below the difference between land cover in Slovenia and the average land cover in the EU28 in 2015. In 2015, the following soil surfaces with important environmental development potential were found in Slovenia:

- 1,934 km² (9%) of cropland,
- 12,380 km² (61%) of wooded areas,
- 529 km² (3%) of areas covered with shrubs,
- 4,391 km² (22%) of grassland, and
- 186 km² (0.9%) of water surfaces and marshes.

⁹ EEA, 2010c: The European environment – state and outlook 2010: Urban environment, European Environment Agency, Copenhagen.

¹⁰ EEA, 2006: Urban sprawl in Europe – The ignored challenge, EEA Report No 10/2006.

¹¹ Piorr A., Ravetz, J. in Tosics, I., Peri-urbanisation in Europe: Towards a European Policy to sustain Urban-Rural Futures, University of Copenhagen/Academic Books Life Sciences, 2011, p. 144, ISBN: 978- 87-7903-534-8. http://www.plurel.net/images/Peri_Urbanisation_in_Europe_printversion.pdf.

¹² SWD(2012) 101 final/2; Commission Staff Working Document: Guidelines on best practice to limit, mitigate or compensate soil sealing

A large share of wooded areas is typical of Slovenia, whose potential for implementing important environmental functions is also large. However, this share of wooded areas is large due to the share of agricultural land, which may be a questionable advantage from the viewpoint of sustainable development.

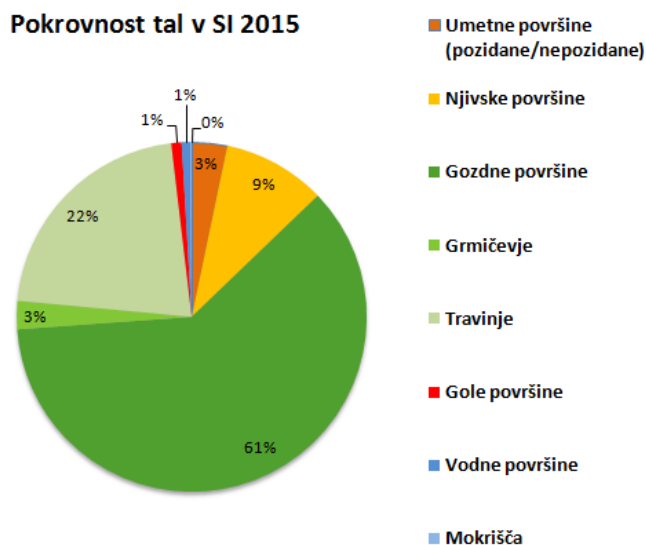
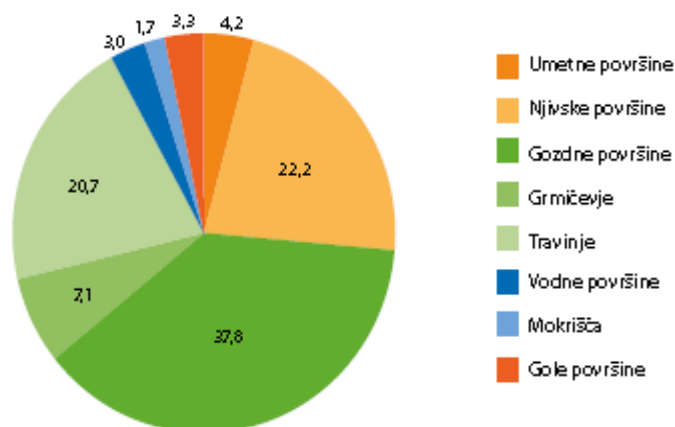


Figure 4: Land cover in Slovenia in 2015

Pokrovnost tal v Sloveniji 2015	Land cover in Slovenia in 2015
Umetne površine (pozidane/nepozidane)	Artificial surfaces (developed/undeveloped)
Njivske površine	Arable land
Gozdne površine	Wooded areas
Grmičevje	Shrubs
Travinje	Grassland
Gole površine	Bare land surfaces
Vodne površine	Water surfaces
Mokrišča	Wetlands

Pokrovnost tal v EU-28
(odstotek skupne površine v letu 2015)



Vir: Eurostat (koda spletnih podatkov: lan_lcv_ovw)

Figure 5: Land cover in the EU28

Pokrovnost tal v EU-28 (odstotek skupne površine v letu 2015)	Land cover in EU-28 (percentage of total surface in 2015)
Umetne površine	Artificial surfaces
Njivske površine	Arable land
Gozdne površine	Wooded areas
Grmičevje	Shrubs
Travinje	Grassland
Vodne površine	Water surfaces
Mokrišča	Wetlands
Gole površine	Bare land surfaces

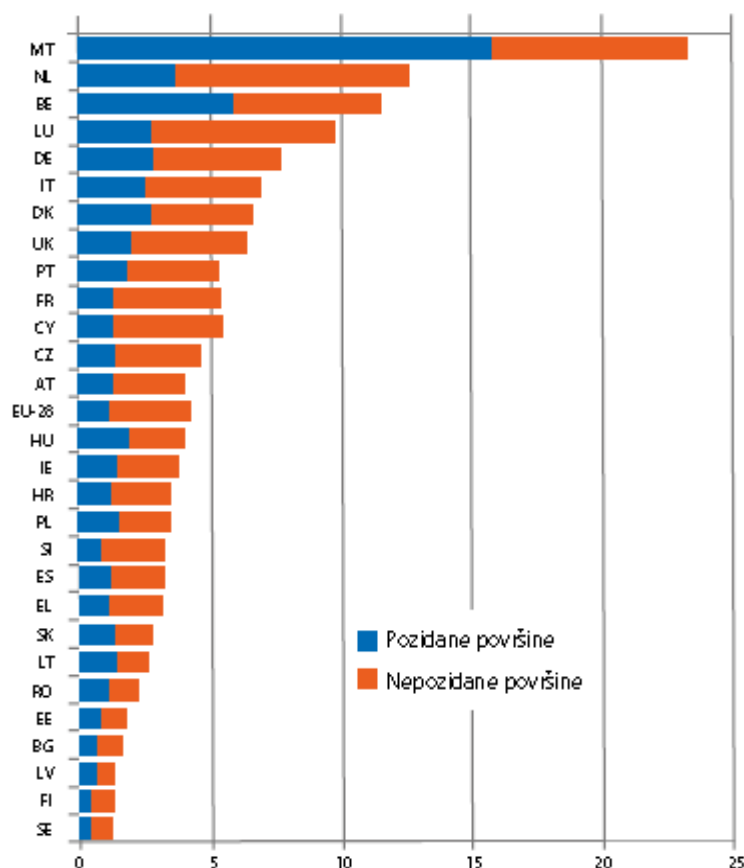
There was 663 km² (3%) of artificial land in Slovenia in 2015, which is one percentage point less than the EU 28 average. The ratio between undeveloped artificial land and developed artificial land in Slovenia was about 3.5 (2.45%/0.76%) in 2015, which does not deviate much from the EU 28 average.

For the period of the largest development relating to soil due to the construction of Slovenian road infrastructure, the Commission determined moderate soil degradation up to 2006 in comparison with other EU regions since it established in its report¹³:

"In Slovenia – like in most European countries – population is hardly growing whereas building activities and land take are growing much faster. Between 1971 and 2007 the Slovenian population increased by 8%, where as the number of dwellings increased by more than 70%. The average annual land take between 1996 and 2006 amounted to approximately 140 hectare per year (or 0.7 m² per citizen and year), which was very moderate in comparison to other countries."

¹³ Overview of best practices for limiting soil sealing or mitigating its effects in EU-27 – Study contracted by the European Commission, DG Environment – April, 2011.

Delež umetnih površin glede na skupno pokrovnost tal, 2015 (odstotek celote)



Vir: Eurostat (koda spletnih podatkov: lan_lcv_art)

Figure 6: Share of artificial land in the EU28

Delež umetnih površin glede na skupno pokrovnost tal, 2015 (odstotek celote)	Share of artificial surfaces as per the total land cover, 2015 (percentage of total amount)
Pozidane površine	Developed areas
Nepozidane površine	Undeveloped areas

Noticeable changes in the use of land

Changes in the use of land take place in three important directions:

- Uneconomic use and use that is unsustainable from the agricultural and environmental aspect as well as soil degradation: in the direction of intensive construction with regards to environmental functions of land with high value. The most negative trend of building highly arable land or the best agricultural land continues. The process evolves mostly on valley floors and along the main transport corridors as well as along the expansion of settlements for the requirements of trade, industry and residential construction.
- Overgrowing of agricultural land continues. The overgrowing process is most intensive in hilly areas with less favourable relief or lower quality soil.
- The degradation of cultural landscape, established over centuries and which was the result of sustainable use of natural resources, continues. Typical diversity of land use in Slovenia (a

combination of cropland, grassland, wooded and other (half) natural landscape) is being lost due to overgrowing, and intensive and dispersed building. It is believed that Slovenia is thus losing its typical spatial identity.

The occurrence of ongoing urbanisation¹⁴ and the changing of landscape in Slovenia could be rightfully discussed as two of the main challenges of soil protection. Once soil is destroyed or severely degraded, future generations will not be able to obtain fertile soil for a long time. The impact of urbanisation severely changes the soil, reduces its capacity to perform agricultural and environmental functions, affects the cycling of nutrients and energy in the environment, and poses a risk for people's health. Physical removal or ongoing soil coverage with impermeable material denotes destruction and permanent reduction/elimination of essential environmental functions of soil.

In Slovenia, urbanisation is a very dispersed process spatially. The changes of use of large areas are noticeable mostly on the brinks of settlements for industrial needs and shops, and along the routes of large infrastructural facilities (motorways). Very important areas are in total mostly represented by small but numerous and very scattered individual constructions, restorations, expansions and renovations of buildings and small infrastructure facilities. Only coherent areas of large forests can be determined without major and numerous changes.

The trend of ongoing soil degradation caused by urbanisation in Slovenia in the 2009–2015 period is seen in the diagram in the figure below. The share of artificial land has been increasing from 609 km² in 2009 to 645 km² in 2012 or 663 km² in 2015. Irrespective of urbanisation, the share of cropland in Slovenia has not decreased in the same period, or has even somewhat increased in the discussed period (from 1,704 km² in 2009 to 1,934 km² in 2015).

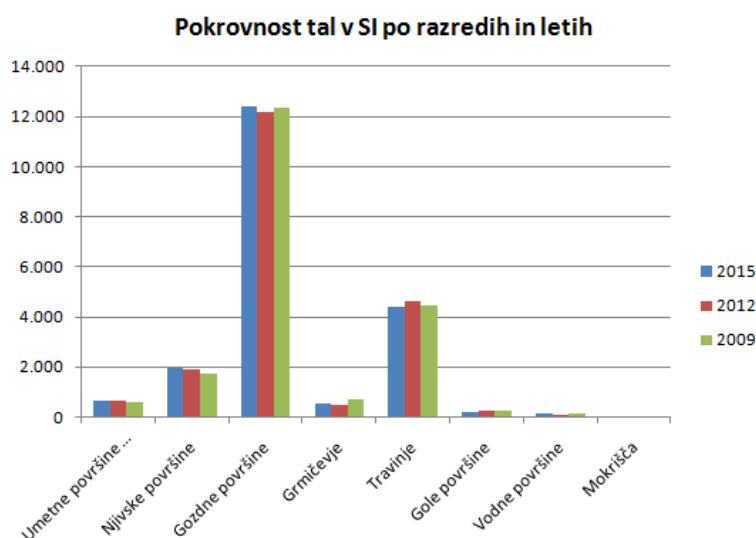


Figure 7: Land cover in Slovenia in the 2009–2015 period

Pokrovnost tal v Sloveniji po razredih in letih	Land cover in Slovenia by classes and years
Umetne površine	Artificial surfaces
Njivske površine	Arable land
Gozdne površine	Wooded areas
Grmičevje	Shrubs
Travinje	Grassland

¹⁴ Urbanisation means expanding urban areas to neighbouring, agricultural or (semi)natural types of land use, which includes the entire spectrum of impact on land (complete sealing, mixing, compaction, pollution).

Gole površine	Bare land surfaces
Vodne površine	Water surfaces
Mokrišča	Wetlands

Land use for agriculture and forestry

Wooded areas

The surface of forests has been constantly growing in recent centuries. Since 1875 when there were only 36% of forest, wooded areas increased to 58.2% of the Slovenian territory until 2017. Forests are thus the prevailing category of actual land use, but they are not equally distributed across the entire territory. The largest coherent wooded areas cover the Dinaric-Karst plateaus of southern and south-western Slovenia and the Alpine slopes in the north and west.

The trend of change in wooded areas is not equally distributed across Slovenia. The area covered by forests is increasing in places where there is much forest from the aspect of landscape diversity and landscape image, while the areas with intensive agriculture and particularly in suburban areas are facing strong pressure on forests, which despite the efforts to preserve forests gradually lead to clearance of the already scarce remains of forests in many places. A suitable share of wooded areas in the landscape must be maintained, particularly protection forests and forests with a special purpose. In the places where landscape lacks forests and minor forest elements, their area, including individual forest trees, should be increased.

As per the results of statistical survey LUCAS, the share of wooded areas has not changed noticeably in the 2009–2015 period. Overgrowing or the change of agricultural land into forest land does not represent irreversible soil degradation from the viewpoint of soil as a part of the environment since this is a reversible land use. From the non-agricultural aspect and from an narrow environmental point of view, it can be assessed as a positive indicator. Through the comprehensive view of changes of land use and their shares in the Slovenian territory, overgrowing is assessed as a negative trend of spatial development. Data on the share of forests place Slovenia among the most wooded European countries. Further intensive overgrowing of agricultural land is a negative process since it results in the degradation of cultural landscape and depletion of diverse semi-natural habitats, which occur with the exchange of agricultural and forest use or with the extensive agricultural land use.

Reverse changes in different agriculture and also overgrowing or even wooded areas are possible and do not affect significantly the quality or reduction of the scope of soil resource.

In addition to degradation of cultural landscape and Slovenia's landscape identity, the overgrowing of agricultural land also poses a threat to reducing the scope of living space. It also represents economic loss since reverse change of wooded areas into agricultural land is linked with higher costs of land development. The change of agricultural into forest land represents conditionally an improvement in soil quality only in the narrow environmental sense.

Agricultural land – cropland and grassland

According to the actual land use, wooded areas are followed by agricultural land. In terms of the actual use (cropland and grassland), agricultural land covered some 31% of Slovenia's territory in 2015. Meadows (22%) and fields (9%) prevail. Most cropland and permanent grassland is located on the gravelly and loamy plains of eastern and north-eastern Slovenia. The share of vineyards is above average in the Primorska region and the hilly edge of the Pannonian Plain. Orchards are most common in the hills of Pannonian Slovenia, while there are also many orchards in the Ljubljana and Celje basins.

Soil quality

As the basic agricultural source, soil is the main topic of the EU common agricultural policy. Soil samples were collected during statistical surveys LUCAS in 2009 and 2015 in order to conduct measurements on soil quality (content of organic carbon) and other parameters such as texture, structure and soil permeability. The impact on soil quality is not assessed in this Environmental Report because measures (guidelines) of SDSS refer only indirectly to the activities that could have an impact on soil quality.

Soil degradation due to waste generation

The Slovenian and common European objective is to reduce quantities of generated waste. The waste that is generated should be reused, recycled or processed in another way. Quantities of waste disposed must be reduced substantially. Only waste for which more suitable management cannot be ensured from the viewpoint of environmental protection and human health are to be disposed. Prevention of waste generation and their suitable management contributes to sustainable use of natural sources.

The generation of waste has a significant impact on soil degradation due to:

- the use of mineral and other raw materials in soil when manufacturing products, which result in waste after their use, and
- disposal of residues from waste treatment.

Municipal waste

Soil degradation due to the disposal of residues from waste treatment is significantly reducing in Slovenia, which is evident in the diagram below that displays annual quantities of disposed residues of municipal waste treatment¹⁵. Although the annual quantity of municipal waste generation increased on average by 6% in the 1995–2016 period, the quantity of disposed residues of municipal waste treatment reduced by more than 90%.

Slovenija - odlaganje komunalnih odpadkov

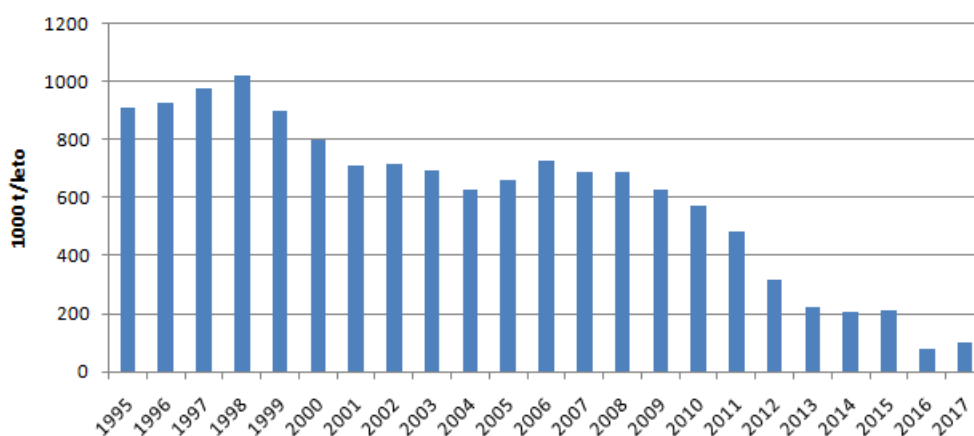


Figure 8: Municipal waste disposal in Slovenia (source: Eurostat)

Slovenija – odlaganje komunalnih odpadkov	Slovenia – municipal waste disposal
1000 t/leto	1,000 t/year

¹⁵ Source: EUROSTAT.

Construction waste and demolition waste

The use of mineral raw ingredients and generation of construction and demolition waste that are linked to soil sealing are of greater importance for soil degradation. Between 200,000 and 700,000 tonnes of construction and demolition waste is on average generated annually in Slovenia (the relevant annual quantity does not include excavated materials during construction work) depending on the intensity of construction work.

The majority of construction and demolition waste is processed, whereby processing includes all procedures which result in waste being used for useful purposes and replace other construction materials¹⁶. Minor part of construction waste (less than 5%) is disposed or used for making of covers for landfills being closed¹⁷.

It is evident from the composition of construction and demolition waste displayed in the table below¹⁸ that they are for the most part composed of waste mineral raw materials – bricks, concrete, ceramics, sand and similar (about 40% on average). These waste mineral raw materials are usually used for backfilling and levelling surfaces at construction sites. This is a completely legitimate method of processing waste mineral raw materials, which in compliance with Directive 2008/98/EC also counts for attaining the objective of a 70-per cent share of processing such waste. However, backfilling and levelling of surfaces with construction waste does not substitute the use of original mineral raw materials in the production of construction products, which would additionally reduce the pressure on soil due to the use of original mineral raw materials.

In order to reduce soil degradation due to the use of mineral raw materials in the production of construction materials, certain attention by administrative bodies is expected when accelerating administrative procedures and raising awareness of construction material processors immediately after the Commission lays down the end-of-waste criteria for construction and demolition waste. Efficient application of these criteria will be beneficial for the environment and the economy.

Table 5: Composition and annual quantity of generated non-hazardous construction waste (excluding excavated material)

Type of waste/quantity (t)	2006	2007	2008	2009	2010	2011	2012
concrete, bricks, tiles and ceramics (waste from group 17 01, except waste 17 01 06*)	151,221	107,971	178,236	186,481	415,985	50,392	61,787
bituminous mixtures (17 03 02)	4,610	5,989	10,902	6,410	8,809	3,762	10,469
wood, glass and plastic (waste from group 17 02, except contaminated waste with dangerous substances 17 02 04*)	57,970	64,617	44,192	69,119	162,453	100,476	53,552
metals, including their alloys (waste from group 17 04, except 17 04 09* - metal waste contaminated with dangerous substances and 17 04 10* - cables)	11,942	10,991	262,637	12,268	65,312	11,870	10,439
insulation materials (17 06 04)	5,855	671	3,140	3,685	860	4,191	3,826
gypsum-based construction materials (17 08 02)	11,945	717	1,453	1,214	1,039	902	786
mixed construction and demolition wastes (17 09 04)	54,210	50,437	145,223	99,338	58,193	82,293	24,750
TOTAL	297,752	241,392	645,782	378,515	712,650	253,886	165,613

¹⁶ Source: Operational plan for waste management (2016).

¹⁷ Source: Screening template for Construction and Demolition Waste management in SLOVENIA–September 2015; Deloitte SA. Member of Deloitte Touche Tohmatsu Limited.

¹⁸ Source: Operational plan for waste management (2016).

4.1.2. FOREST

From the viewpoint of attaining sustainable development objectives, forest is an important natural source since wood is a natural and renewable raw material, which may be reused and recycled, and is climate- and environmentally-friendly because it enables the storage of organic carbon for at least 50 years.

As applicable in the entire European forest landscape, this is also a mosaic in Slovenia designed to a great extent by man. Forests extend over 182 million hectares in the European Union and represent 5% of world wooded areas. In total, forests cover 43% of EU surface; two thirds of wooded areas of the European Union are found in six EU Member States (Sweden, Finland, Spain, France, Germany and Poland).

At the level of the EU, Slovenia with its 58.2% of wooded areas together with Finland and Sweden noticeably derogates from the average of EU Member States. Contrary to numerous regions in the world where deforestation is still a burning issue, wooded areas in the European Union are growing. Between 1990 and 2010, they have increased by about 11 million hectares particularly due to natural expansion and the effects of afforestation or rather the abandonment of the use of land for agricultural production.

When providing assessments on wooded areas in Member States, the question about what is a forest is being rightfully raised. There is no answer to such a simple question at first sight, which would be common to all EU Member States. The classification determined by the Food and Agriculture Organisation of the United Nations is used for the preparation of EUROSTAT assessments on wooded areas in the European Union on the basis of which a 'forest' is land with a tree crown cover of at least 10% (or equivalent stocking level) and area of more than 0.5 hectares, and the trees must reach at least a height of 5 metres at maturity in situ.

The diversity of forests in the European Union reflects its geographical and climate diversity (boreal forests, Alpine coniferous forests, etc.). Their distribution is namely dependent on the climate, soil, altitude and relief. Mere 4% of forests were not altered by man, 8% are forest plantations and the rest fall under the category of 'semi-natural' forests managed by man. European forests are mostly privately owned (about 60% of surfaces) and publicly owned (40%) to a minor extent.

From the environmental viewpoint, forests perform many ecosystem services: they contribute to soil protection (from erosion), are part of the water cycle, and regulate local (by evapotranspiration) and global climate (particularly by storing carbon).

As the habitats of numerous species, they also protect biodiversity, and from the social and economic aspect, forest exploitation generates resources, particularly wood. The largest share of wood in the European Union is used for energy production (42%), 24% of it is processed at sawmills, 17% in the paper industry and 12% in the wood panel industry.

About one half of energy from renewable sources is obtained from wood in the European Union. Forests also provide 'non-wood' products (i.e. products that are not wood), including certain foods (soft fruit and mushrooms), cork, resins and oils, and certain services take place in them too (hunting, tourism, etc.).

Forestry measures in the European Union

Forests are not specifically mentioned in the founding treaties; as a result, the European Union has no common forestry policy. It thus remains in the jurisdiction of individual Member States. Nevertheless,

numerous measures of the European Union affect forests in its territory and also broader in third countries.

New EU Forest Strategy

In September 2013, The Commission defined the new EU strategy in the Communication entitled 'A new EU Forest Strategy: for forests and the forest-based sector'¹⁹ and proposed an European framework of reference to form sector policies affecting forests. This strategy has two main objectives:

- to ensure sustainable management of European forests, and
- strengthen the EU's contribution to promoting sustainable forest management and reducing deforestation at global level.

The purpose of the new EU Forest Strategy is to set forests and the forest-based sector in the centre of efforts to transfer to green economy and evaluate the benefits which forests can ensure sustainably, and to simultaneously ensure their protection or sustainable use.

The Common Agricultural Policy as the main source of EU funds for forests

Some 90% of EU funds for forests come from the European Agricultural Fund for Rural Development. The Fund ensures the implementation of investments in the forest area development and the improvement of the viability of forests: afforestation and establishment of woodland areas; establishment of agro-forestry systems; prevention and elimination of damage to forests caused by fires, natural and other severe disasters; investments improving the resilience and environmental value of forest ecosystems; investments in forestry technologies and processing, and in the promotion and marketing of forest products.

Other EU measures related to forests important for Slovenia

At the level of the European Union, Directive 1999/105/EC regulates the marketing of forest reproductive material.

European regulations regarding plant health are aimed at combating the spread of organisms harmful to forests (Directive 2000/29/EC).

The legally binding objective of the energy policy is to increase the share of energy from renewable sources in the total energy consumption to 20% by 2020, which would result in an increased forestry biomass demand (Directive 2009/28/EC). The new EU's 2030 framework for climate and energy policies anticipates an increase of this share to as much as 27%.

Some 37.5 million hectares of European forests are classified in the Natura 2000 network for nature conservation, established within the framework of the EU environmental policy. Reasonable use of forests is part of thematic priorities of the new Programme for the Environment and Climate Change (LIFE 2014–2020, Regulation (EU) No 1293/2013). The EU biodiversity strategy²⁰ determines that plans for sustainable management of public forests will be implemented by 2020.

The EU also supports green procurements²¹, which can promote demand for sustainable grown wood.

Forest objectives

¹⁹ A new EU Forest Strategy: for forests and the forest-based sector – COM (2013) 659.

²⁰ An EU biodiversity strategy to 2020 – COM (2011) 244.

²¹ Public procurement for a better environment – COM (2008) 400.

The New EU Forest Strategy defined the following objectives for forests until 2020:

- to ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles and that the EU's contribution to promoting sustainable forest management and reducing deforestation at global level is strengthened.

In 2015, the Commission adopted a Multi-annual Implementation Plan of the New EU Forest Strategy²². The plan includes a number of measures for a coherent and coordinated approach to various policies and initiatives in the forestry sector. The multi-annual plan determines a reference framework for all new measures in various fields, including measures of the Member States if these are related to forests. Eight priorities of this multi-annual plan are based on three pillars of sustainable forest management, i.e. social, economic and environmental:

- supporting our rural and urban communities,
- fostering the competitiveness and sustainability of forest-based industries, bioenergy and the wider green economy,
- maintaining forest resilience in a changing climate,
- protecting forests and enhancing ecosystem services,
- forest information and monitoring,
- research and innovation,
- working together to coherently manage and better understand our forests, and
- forests from a global perspective.

Forest management in Slovenia

Forest management is implemented in Slovenia traditionally according to the principles of sustainability and multi-functionality that are defined in both umbrella documents governing the manner of forest management in Slovenia, i.e. the Resolution on National Forest Programme and the Act on Forests²³.

The National Forest Programme determines the invaluable role that forest plays in the favourable state of the environment in Slovenia. Forest is considered the most important ecosystem in Slovenia that contributes to the stability of the relationship between the anthropogenic and natural environments. Ensuring the stability of forest as an ecosystem and planned guidance of its development are important parts of Slovenia's long-term development objectives.

Although forests' general benefits in sustainable development are more important in Slovenia's territory, its economic significance should not be neglected. Tradition and knowledge in Slovenian forestry and wood industry can largely contribute to the enrichment of wood from our forests and permanently contribute their share to generating the added value, particularly in non-urban areas.

The existing legislative and governance framework of forest management in Slovenia ensures that sustainable forest management will be further successfully and efficiently implemented on the basis of measures from the New EU Forest Strategy.

4.1.3. AIR

²² Multi-annual Implementation Plan of the New EU Forest Strategy – SWD (2015) 164.

²³ Resolution on National Forest Programme (Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 111/07) and the Act on Forests (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 30/93, 56/99 – ZON, 67/02, 110/02 – ZGO-1, 115/06 – ORZG40, 110/07, 106/10, 63/13, 101/13 – ZDavNepr, 17/14, 22/14 – Constitutional Court Decision, 24/15, 9/16 – ZGGLRS and 77/16).

The objectives for improving air quality are determined in Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants (the NEC Directive) and the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to the 1979 Convention on Long-range Transboundary Air Pollution (the Gothenburg Protocol). Managing and reducing emissions is also an objective of the National Environment Protection Programme, which contains several operational programmes with similar objectives. Its purpose is to ensure better quality of ambient air by gradually reducing SO₂, NO_x and NH₃ emissions. Lower emissions would mean less ground-level ozone, acidification and eutrophication.

Table 6: Deviation of pollutant emission levels from national ceilings in the 2010–2012 period

Deviation of emission levels from ceilings	NO _x	NMVO _C	SO ₂	NH ₃
Ceilings for Slovenia by 2020	45 kt	40 kt	27 kt	20 kt
Reduction of emissions for Slovenia by 2030 with regard to emissions in 2005	- 65%	- 53%	- 92%	- 15%
Departures in 2010	- 1%	- 14%	- 64%	- 13%
Departures in 2011	+ 3%	+ 2%	- 60%	- 11%
Departures in 2012	0%	- 2%	- 62%	- 12%

Slovenia has a relatively good regulation for pollutant emissions, for which ceilings have been determined on the basis of Directive (EU) 2016/2284, which is shown in the table above. National emission ceilings set for nitrogen oxides at 45,000 tonnes, sulphur dioxide at 27,000 tonnes and ammonia at 20,000 tonnes in 2010 must not be exceeded even after 2010. The revision of the Gothenburg Protocol and the NEC Directive prescribes further reduction in pollutant emissions by 2030, which is evident in the table above.

Emissions of substances that cause acidification and eutrophication

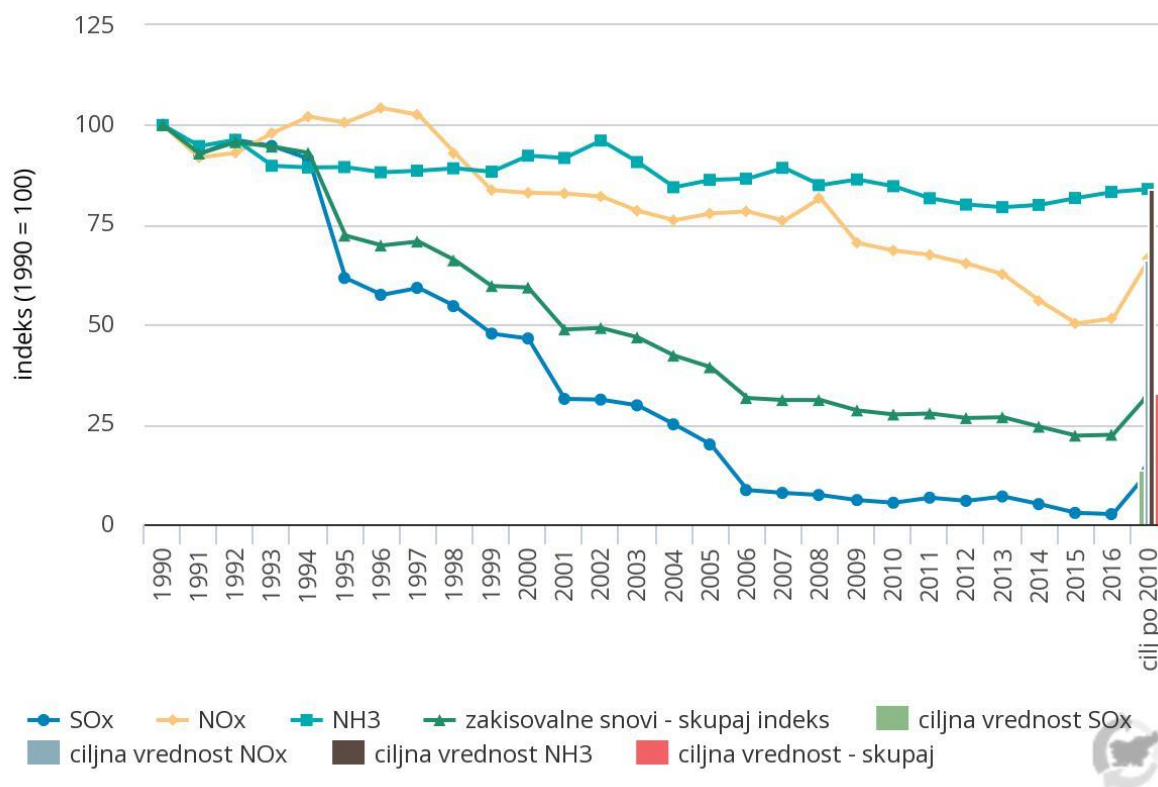


Figure 9: Emissions of substances causing acidification and eutrophication in Slovenia in the 1990–2016 period
 (source: National database on air emissions, the Slovenian Environment Agency, 2018)

Indeks (1990 = 100)	Index (1990 = 100)
Cilj po 2010	Objective after 2010
SOx	SOx
NOx	NOx
NH3	NH3
Zakisovalne snovi – skupaj indeks	Acidifying substances – total index
Ciljna vrednost SOx	Target value of SOx
Ciljna vrednost NOx	Target value of NOx
Ciljna vrednost NH3	Target value of NH3
Ciljna vrednost – skupaj	Target value – total

The indicator [ZR09] displays the movement of gas emissions that cause acidification and eutrophication and the structure of individual gas emissions according to the source of pollution in the 1990–2016 period. The substances causing acidification include sulphur oxides (SO_x), nitrogen oxides (NO_x) and ammonia (NH₃). Nitrogen oxides and ammonia also contribute to eutrophication. Total emissions of substances that cause acidification and eutrophication are expressed as the sum of emissions of all three pollutants multiplied by the associated acidification factors. Emissions are shown as an acidification equivalent.

Total emissions of substances causing acidification and eutrophication dropped by 78% in Slovenia in the 1990–2016 period. Emissions of sulphur oxides decreased the most, by 97%. Nitrogen oxide emissions decreased by 48% and ammonia emissions by 17%. Emissions of sulphur oxides, nitrogen oxides and ammonia were lower than the prescribed target values in 2016, which must not be exceeded since 2010.

Sulphur oxide emissions

Sulphur oxides are generated in the combustion of fuel which contains sulphur. These were reduced by 97% in the 1990–2016 period. The reduction was particularly the result of installing desulphurisation facilities in thermal power plants (Šoštanj and Trbovlje), the use of imported coal with low sulphur content (Ljubljana), the introduction of liquid fuels with lower sulphur content and replacement of liquid and solid fuels in the industry with natural gas.

The largest source of sulphur oxide emissions was the energy supply sector according to the data for 2016. The electricity and heat generation contributed 35% of sulphur oxides to total national emissions. Total sulphur oxide emissions in 2016 were 81% lower than the target value, which may not be exceeded since 2010. In gas emissions that cause acidification and eutrophication, sulphur oxides amounted to 8%.

Ammonia emissions

The biggest share of emitted substances that cause acidification and eutrophication in 2016 was represented by ammonia. The share of ammonia in total emissions was 53%. The main source of ammonia is agriculture, which contributes as much as 90% to total national ammonia emissions. Ammonia emissions in 2016 were lower by 17% in comparison to 1990. The reduction of emissions is mostly the result of the lower number of livestock. Ammonia emissions in 2016 were 8% lower than the target value, which may not be exceeded since 2010.

Nitrogen oxide emissions

The share of nitrogen oxide emissions in total emission of substances that cause acidification and eutrophication was 39% in 2016. According to data for 2016, the main source of nitrogen oxide emissions was road traffic (50%), followed by energy supply and other traffic (11%). Compared to 1990, NO_x emissions were reduced by 48%, the most in traffic due to stricter emission standards for motor vehicles, implementation of measures in thermal power plants and heating plants, as well as the replacement of fuel and improvement of combustion processes in industry. Total nitrogen oxide emissions in 2016 were 17% lower than the target value, the exceeding of which was forbidden from 2010.

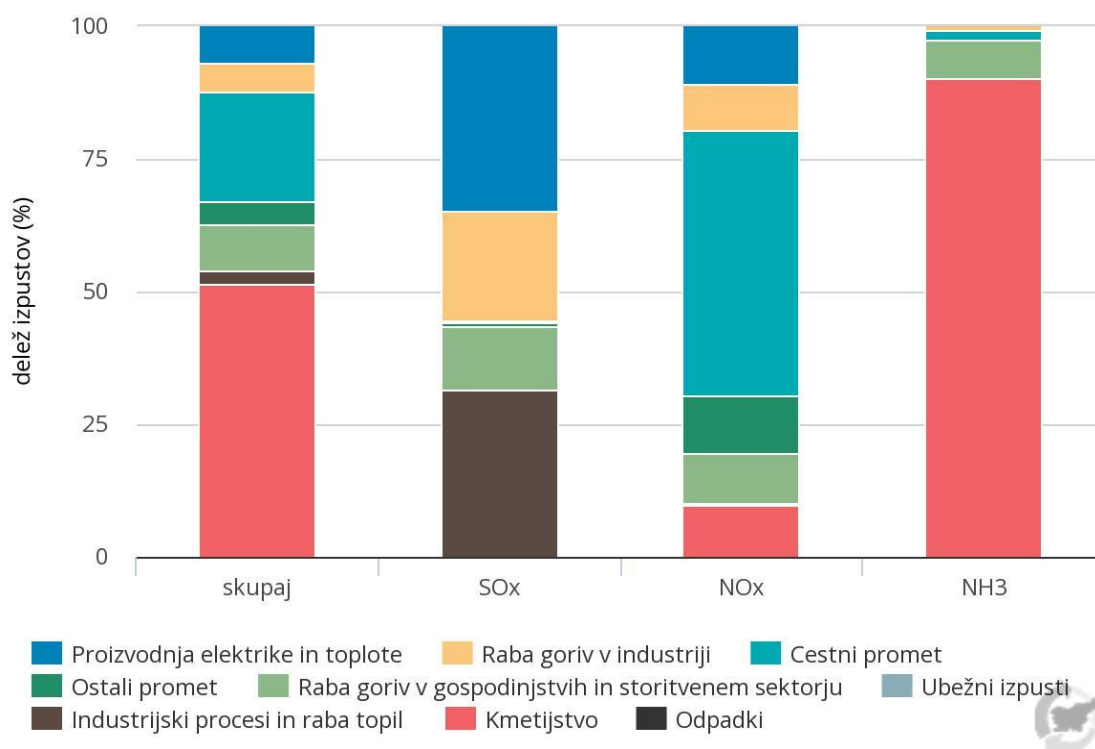


Figure 10: Structure of substance emissions causing acidification and eutrophication in Slovenia by sectors in the 2016 period (source: National database on air emissions, the Slovenian Environment Agency, 2018)

Delež izpustov (%)	Share of emissions (%)
Skupaj	Total
Proizvodnja elektrike in toplote	Production of electricity and heat
Raba goriv v industriji	Use of fuels in industry
Cestni promet	Road traffic
Ostali promet	Other traffic
Raba goriv v gospodinjstvu in storitvenem sektorju	Use of fuels in households and the service sector
Ubežni izpusti	Fugitive emissions
Industrijski procesi in raba topil	Industrial processes and the use of solvents
Kmetijstvo	Agriculture
Odpadki	Waste

Total emission of substances that cause acidification and eutrophication

In 2016, Slovenia exceeded the EU28 average per capita with the value of 1.0 kg of emissions of substances that cause acidification and eutrophication. Among the EU28, Slovenia was placed 13th in 2016.

Other facts and implementation of measures relating to emissions

To attain target values, measures were adopted in the field of improving energy efficiency, replacement of solid fossil fuels with natural gas and renewable energy sources, introduction of stricter emission standards for motor vehicles, consistent implementation of environmental legislation, particularly in the field of comprehensive prevention and supervision of industrial pollution (application of best available technologies) and promotion of good agricultural practice.

Emissions of substances causing acidification are harmful for people's health and cause damage to water ecosystems, forests, crops and buildings due to accelerated corrosion. Negative effects of acidification depend on the acidification potential of individual pollutants and the features of individual ecosystems and materials. The most powerful acidification effect has ammonia, which also contributes to the eutrophication effect. Excessive accumulation of nutrients in water (eutrophication) can cause the reduction in, and change of, biodiversity.

The NO_x emissions also contribute to the emergence of ground-level ozone, which is generated during complicated photo-chemical reactions in the lower layers of atmosphere during increased solar radiation, particularly in the summer months, and which causes respiratory diseases in people.

In addition to acidification and eutrophication, the NO_x, SO_x and NH₃ emissions also cause the formation of dust particles affecting increased incidence of respiratory diseases. NO_x, SO_x and NH₃ are called secondary particulate matter or precursors of PM₁₀, which are as the result of physical and chemical reactions transformed into particulate matter measuring 10 µm in diameter or less.

Particulate emission to air

The indicator [ZR15] shows the movement of emissions of total suspended particulates (Total Suspended Particles – TSP), primary particulates smaller than 10 µm (PM₁₀) and primary particulates smaller than 2.5 µm (PM_{2.5}) into the air in the 2000–2016 period, and the structure of particulates in terms of various sources of pollution. As per the source, we distinguish primary and secondary particles. Primary particles derive from sources on the surface while the secondary particles are the result of different transformations in polluted atmosphere. Particles may be of natural origin (pollen, dust, sea salt, smoke from forest fires, meteor dust, volcanic ash, etc.) or anthropogenic origin (emissions from energy facilities, industry, traffic, agriculture, individual heating systems). Regarding the source, particles may have various chemical composition, form and physical nature.

Emissions of primary particles smaller than 10 µm (PM₁₀) increased by 12% in the 2000–2016 period. Emissions of primary particles smaller than 2.5 µm (PM_{2.5}) increased by 17% in the same period. Emissions of total suspended particulates (TSP) into the air increased by 7% as per the year 2000. The main source of particle emissions is the consumption of fuel in households and the service sector.

The Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (the Gothenburg Protocol) to the 1979 Convention on Long-range Transboundary Air Pollution (CLRTAP) and Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants (the NEC Directive) prescribe the reduction of emissions of primary particles PM_{2.5} by 25% after 2020 in comparison to the value of emissions in 2005.

In the 2000-2016 period, particle emissions (TSP, PM₁₀, PM_{2.5}) decreased the most in industrial processes and the use of solvents, fugitive emissions, electricity and heat generation, agriculture and non-road traffic. In the same period, particle emissions increased the most in road traffic, and the consumption of fuel in households and the service sector. Favourable price of wood compared to other energy products for heating also contributed to the increase of particle emissions from households.

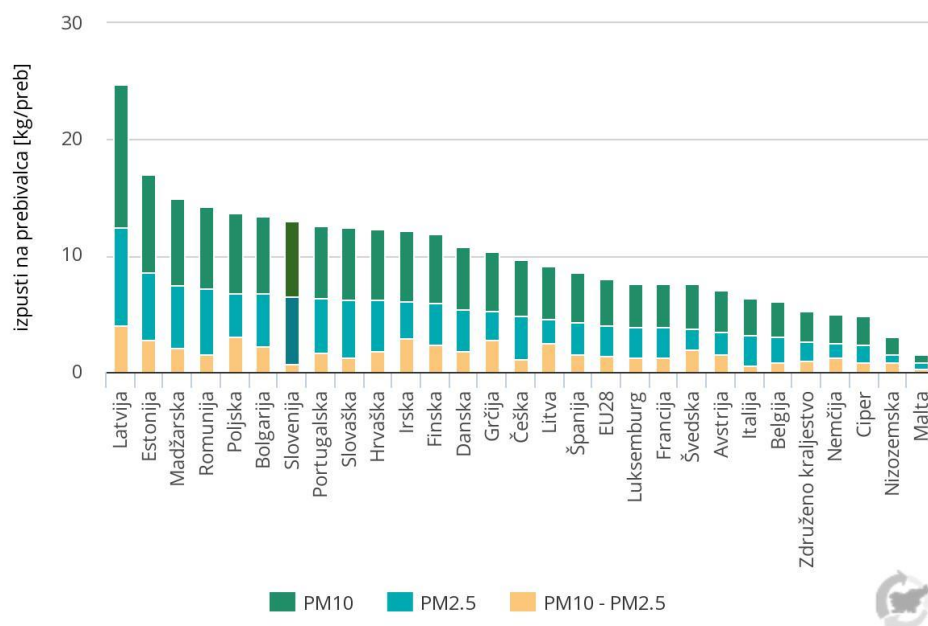


Figure 11: Particle emissions in Slovenia in the 1990–2015 period (source: Air pollutant emissions data viewer (LRTAP Convention), European Environment Agency; Eurostat, 2018)

Izpusti na prebivalca (kg/preb)	Emissions per capita (kg/capita)
Latvija	Latvia
Estonija	Estonia
Madžarska	Hungary
Romunija	Romania
Poljska	Poland
Bolgarija	Bulgaria
Slovenija	Slovenia
Portugalska	Portugal
Slovaška	Slovakia
Hrvaška	Croatia
Irska	Ireland
Finska	Finland
Danska	Denmark
Grčija	Greece
Češka	Czech Republic
Litva	Lithuania
Španija	Spain
EU28	EU28
Luksemburg	Luxembourg
Francija	France
Švedska	Sweden
Avstrija	Austria
Italija	Italy
Belgija	Belgium
Združeno kraljestvo	United Kingdom
Nemčija	Germany
Ciper	Cyprus

Nizozemska	Netherlands
Malta	Malta

The main source of particle emissions is the consumption of fuel in households and the service sector, followed by road traffic. In 2016, the largest share of emissions of particles $PM_{2.5}$ was attributed to small heating units (75%), mainly due to the use of wood in inefficient old solid fuel boilers or other plants with non-optimum combustion of wood biomass. The share of this source increases with decreasing of the size of particles, which means that particles $PM_{2.5}$ prevail among emissions from combustion of wood biomass.

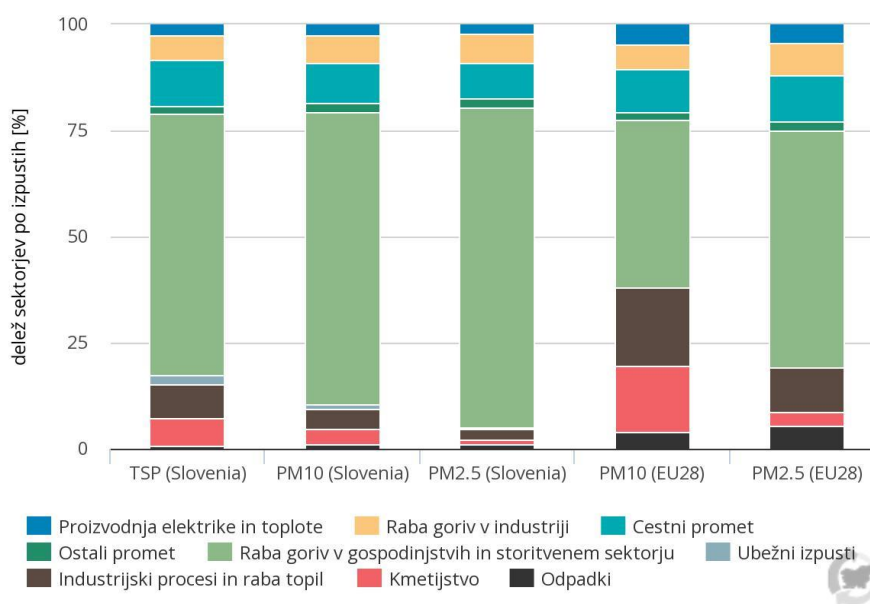


Figure 12: Structure of particle emissions in Slovenia by sectors in the 2016 period (source: National database on air emissions, the Slovenian Environment Agency, 2018; Air pollutant emissions data viewer (LRTAP Convention), European Environment Agency, 2018)

Delež sektorjev po izpustih (%)	Sectors' share by emissions (%)
Proizvodnja elektrike in toplote	Production of electricity and heat
Raba goriv v industriji	Use of fuels in industry
Cestni promet	Road traffic
Ostali promet	Other traffic
Raba goriv v gospodinjstvu in storitvenem sektorju	Use of fuels in households and the service sector
Ubežni izpusti	Fugitive emissions
Industrijski procesi in raba topil	Industrial processes and the use of solvents
Kmetijstvo	Agriculture
Odpadki	Waste

With the value of 6.5 kg of primary PM_{10} particles per capita, Slovenia was ranked 7th among the EU28 countries in 2016.

To reduce PM_{10} emissions in Slovenia, the following measures are anticipated as per the Operational programme for the protection of ambient air against pollution:

- reduce emissions from small combustion units at national, regional and local levels;
- reduce emissions from road traffic at national, regional and local levels;
- reduce emissions from industrial sources;

- reduce emissions generated during construction works.

The measures to reduce primary and secondary PM₁₀ particle emissions in ambient air include improvement of energy efficiency and combustion processes, replacement of solid fossil fuel with natural gas and renewable energy sources, introduction of stricter emission standards for motor vehicles, and consistent implementation of environmental legislation.

Primary particles PM₁₀ are particulate matter with a diameter of 10 µm or less, which are emitted directly into the air (PM₁₀). Secondary particles or secondary particulate precursors PM₁₀ include NO_x, SO_x and NH₃, which are as the result of physical and chemical reactions transformed into particulate matter measuring 10 µm in diameter or less.

Inhaling particles can cause frequent and serious respiratory and cardiovascular diseases, which increases the possibility of premature death. In the recent period, majority of research is focusing on examining the impact of fine particles on people's health. The smaller the particles the more dangerous they are for human health since they penetrate deeper into the respiratory tract. Particles larger than 10 µm stop in the upper respiratory tract (nose, sinuses), while particles smaller than 10 µm travel into the lower respiratory tract. Particles smaller than 2.5 µm penetrate deep into the lungs.

Emissions of ozone precursors

The indicator [ZR10] shows the movement of emissions of gases that cause the production of ground-level ozone in the 1990–2015 period and the structure of emissions of individual gases in terms of the source of pollution. An ozone precursor is a substance that contributes to the production of ground-level (tropospheric) ozone. Ozone precursors include nitrogen oxides (NO_x), carbon oxide (CO), methane (CH₄) and non-methane volatile organic compounds (NMVOC).

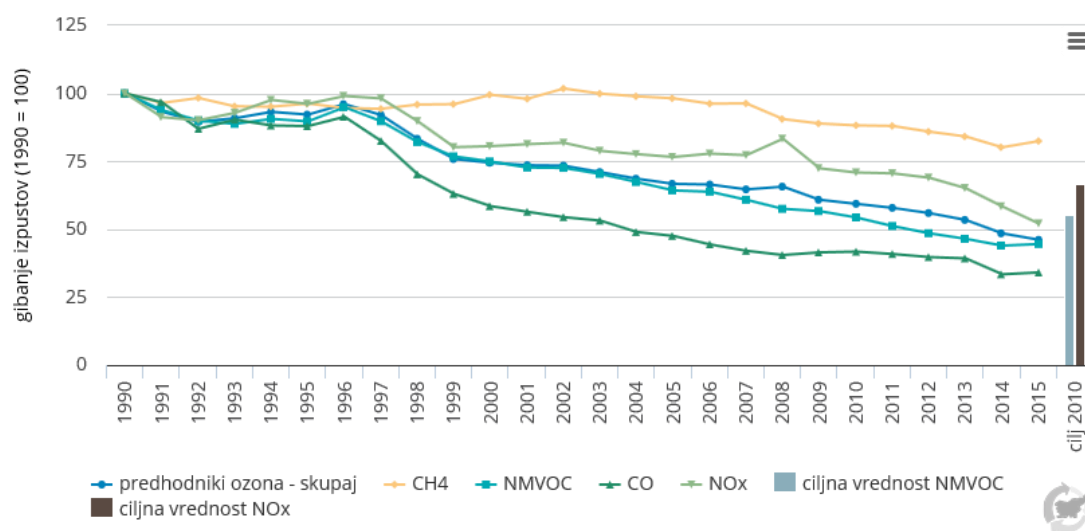


Figure 13: Emissions of ozone precursors in Slovenia in the 1990–2015 period (source: National database on air emissions, the Slovenian Environment Agency, 2017)

Gibanje izpustov (1990 = 100)	Movement of emissions (1990 = 100)
Cilj 2010	Objective 2010
Predhodniki ozona – skupaj	Ozone precursors – total
CH ₄	CH ₄
NMVOC	NMVOC
CO	CO
NO _x	NO _x

Ciljna vrednost NMVOC	Target value of NMVOC
Ciljna vrednost NOx	Target value of NOx

Emissions of all ozone precursors dropped by 54% between 1990 and 2015. Emissions of nitrogen oxides decreased by 48%, carbon oxide by 66%, non-methane volatile organic compounds by 55% and methane by 18%. The emissions were reduced particularly due to the introduction of stricter emission standards for motor vehicles, which contributed to a significant reduction of emissions of nitrogen oxides and carbon oxide from road traffic, which is the main source of ozone precursors. Emissions of nitrogen oxides and non-methane volatile organic compounds were lower than the prescribed target values in 2015, which must not be exceeded since 2010.

The main source of total emissions of ozone precursors in 2015 was traffic (41%), followed by consumption of fuel in households and the service sector (20%). The contribution from other sectors was smaller.

The main source of emissions of nitrogen oxides in 2015 was traffic (65%). Contributing the most to emissions of carbon oxide was the consumption of fuel in households and the service sector (63%). The main source of methane emissions was agriculture (58%). Industrial processes and the use of solvents are the largest source of non-methane volatile organic compounds (31%).

Slovenia is one of the countries with highest emissions of ozone precursors per capita. In 2015, Slovenia ranked 9th among EU28 countries with 43 kg of emissions of ozone precursors per capita. The EU28 average was 36 kg/capita.

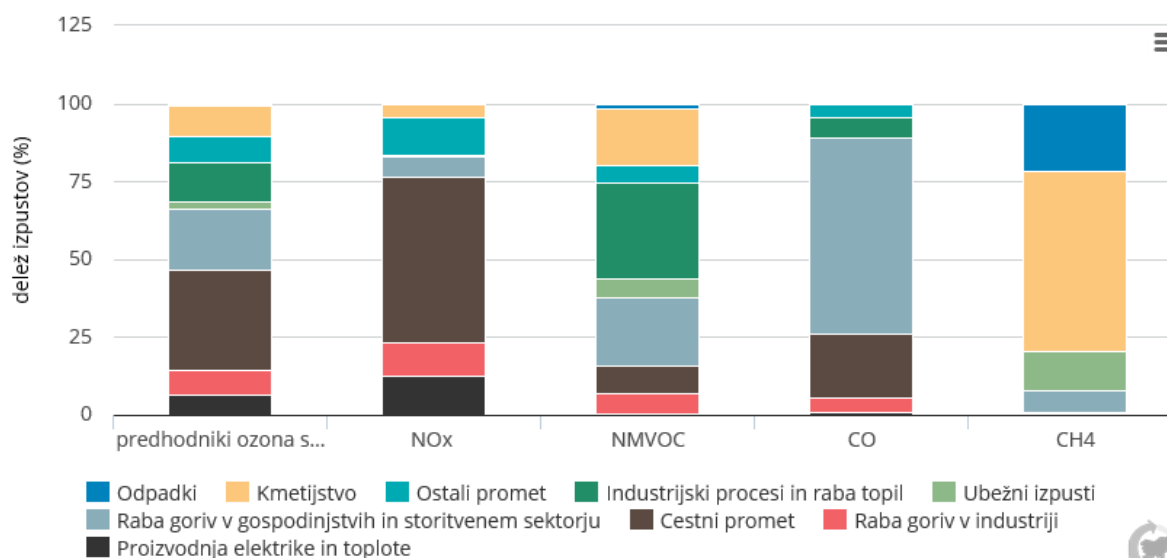


Figure 14: Structure of particle emissions in Slovenia by sectors in the 2015 period (source: National database on air emissions, the Slovenian Environment Agency, 2017)

Delež izpustov (%)	Share of emissions (%)
Predhodniki ozona s...	Ozone precursors
Odpadki	Waste
Kmetijstvo	Agriculture
Ostali promet	Other traffic
Industrijski procesi in raba topil	Industrial processes and the use of solvents
Ubežni izpusti	Fugitive emissions
Raba goriv v gospodinjstvu in storitvenem sektorju	Use of fuels in households and the service sector

Cestni promet	Road traffic
Raba goriv v industriji	Use of fuels in industry
Proizvodnja elektrike in toplote	Production of electricity and heat

To attain the set objectives, measures were adopted in the field of energy efficiency improvement, the introduction of stricter emission standards for motor vehicles, reduction in the content of solvents in paints, cleansers and other products, and consistent implementation of environmental legislation, particularly regarding comprehensive prevention of industrial pollution (application of the best available technologies) and limiting pollution from large combustion plants.

Ozone precursors contribute greatly to the production of ground-level (tropospheric) ozone. Since the latter is a strong oxidant, it has a harmful effect on the health of people and ecosystems. High concentrations of ground-level ozone may have a negative effect on people's respiratory system, particularly lungs, and also cause damage to leaves, reduce plant resilience to diseases and reduce the quantity of produce.

4.1.4. WATER

Four types of landscape meet on Slovenian territory: the Alps, the Dinaric Alps, the Pannonian Plain and the Mediterranean, which gives Slovenia great landscape diversity, varied geological ground composition and diverse terrain. This diversity is also reflected in all forms of surface water, from torrents, small rivers, streams and rivers to subterranean rivers, springs, lakes and the sea.

Two water areas are found in the territory of Slovenia: the water area of the Adriatic Sea and the water area of the Danube River. The water area of the Danube River covers 81% of Slovenian territory, while almost a fifth of the territory belongs to the water area of the Adriatic Sea. Basic hydrogeographic units are separated by the main rivers into the Mura River basin (Pomurje), the Drava River basin (Podravje) and the Sava River basin (Posavje) with the Kolpa River (Pokolpje), and the catchment areas of the Soča River (Posočje) and other Adriatic rivers.

Surface water

Some 96% of surface water bodies in Slovenia are defined as having good chemical status, while five sea water bodies have poor chemical status due to tributyltin compounds. In general, Slovenian surface waters are not polluted by priority or priority hazardous substances.

Between 2009 and 2015, 59% of surface water bodies in Slovenia were assessed as achieving good ecological status. Hydromorphological changes and general degradation are the main reasons for moderate or poor ecological status of surface waters. If compared to the past period, 6% more water bodies attain good status.

Ecological status of surface waters

In the 2009–2015 period, it was assessed that 59% of surface water bodies achieved at least good ecological status and thus meeting the objectives of the Water Directive. Whereby 38% of water bodies did not attain good ecological status and 3% of water bodies were not assessed. Hydromorphological modification together with recognised general degradation as the only reason or together with other burdens remains the most large-scale burden for 83% of water bodies that do not attain good ecological status. Hydromorphological modification and general degradation are broad and interconnected factors whose effects on the status of communities of fish and benthic invertebrates cannot be separated. Hydromorphological modification includes direct anthropogenic changes to watercourses: regulation, reinforcement of embankments, removed riparian vegetation, barriers, etc.,

while general degradation causes changes in the hinterland of a watercourse due to settlements, agriculture and industry.

Burdening with nutrients and organic substances is to a minor extent the cause of non-attaining the objectives of the Water Directive. In the 2009–2015 period, some 18% of water bodies did not attain good ecological status due to excessive burdening with nutrients, and 12% of water bodies due to burdening with organic substances. The main sources of burdening watercourses with nutrients and organic substances include leaching from agricultural land, and municipal and industrial wastewater discharges.

Water bodies of the Mura River basin received the worst grades in Slovenia since 86% of them do not attain good ecological status, mostly because of several simultaneous burdens: overburdening with nutrients and organic substances, hydromorphological modification and general degradation. A frequent problem in this part of Slovenia is the exceeding of limit values of certain specific pollutants since moderate ecological status is determined for certain Mura tributaries because of excessive limit values of s-metalochlor, cobalt and terbuthylazine, which complies with agricultural activities in this part of Slovenia. More than one half of water bodies in the Drava basin and the area of the middle Sava do not attain good ecological status, the main reasons for this being hydromorphological modification and general degradation with nutrient burdening. The ecological status of the Adriatic rives, watercourses in the Soča basin and the upper Sava received best grades in the 2009–2015 period, where more than three quarters of water bodies attained at least good ecological status.

In the 2009–2015 period of assessing ecological status, visible progress was made when reducing the share of water bodies that were not assessed in comparison with the 2006–2008 period, so that only the artificial water bodies and the candidates for the heavily modified water bodies of the sea have not been assessed, for which no evaluation methodologies have been developed yet. In addition to developing new methodologies for assessing biological quality elements, the upgrade of the existing methodologies is also underway, which means that it is impossible at this point to compare ecological statuses in various periods and assess progress in the ecological status of individual surface water bodies.

Chemical status of surface waters

Good chemical status in the 2009–2013 period was determined for 149 (96%) surface water bodies. Poor chemical status was established for five water bodies (3%) and one water body (Škocjanski zatok) was not assessed. If compared with the assessment of chemical status in the 2006–2008 period, the chemical status of surface waters improved at two water bodies in the 2009–2013 period, which means the improvement of chemical status by 1% of surface water bodies. All water bodies of coastal and territorial sea have poor chemical status as was established already in the 2006–2008 period. The reason for poor chemical status is the exceeding of the environmental quality standard for tributyltin compounds that were used as biocides in anti-fouling paints.

The assessment of chemical status of surface waters relating to the content of mercury in organisms is displayed separately. Mercury is transmitted over long distances by atmospheric deposition, and is generally present in Europe in organisms in surface waters in concentrations that exceed the environmental standard for organisms. Mercury was monitored in Slovenia in organisms at 26 measuring sites and international profiles in areas where human operations have no impact and in mining areas. Exceeding the environmental standard was determined at 23 measuring sites, and the environmental standard of 20 µg/kg was not exceeded at only three measuring sites. The chemical status of surface waters on which monitoring of the content of mercury in organisms had not been implemented was determined by experts on the basis of results of model evaluation of mercury atmospheric input EMEP (Convention on Long-Range Transboundary Air Pollution). Poor chemical status relating to the content of mercury in organisms was assessed for 150 surface water bodies, while good chemical status was established for three water bodies, and two were not assessed.

A probability assessment of attaining environmental objectives on surface water bodies was made for the Water Management Plan for the Danube River Basin for the 2016–2021 Period²⁴ and the Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period²⁵ (hereinafter: NUV) under the condition that measures of the Programme for Water Management Measures will be implemented in the 2016–2021 period.

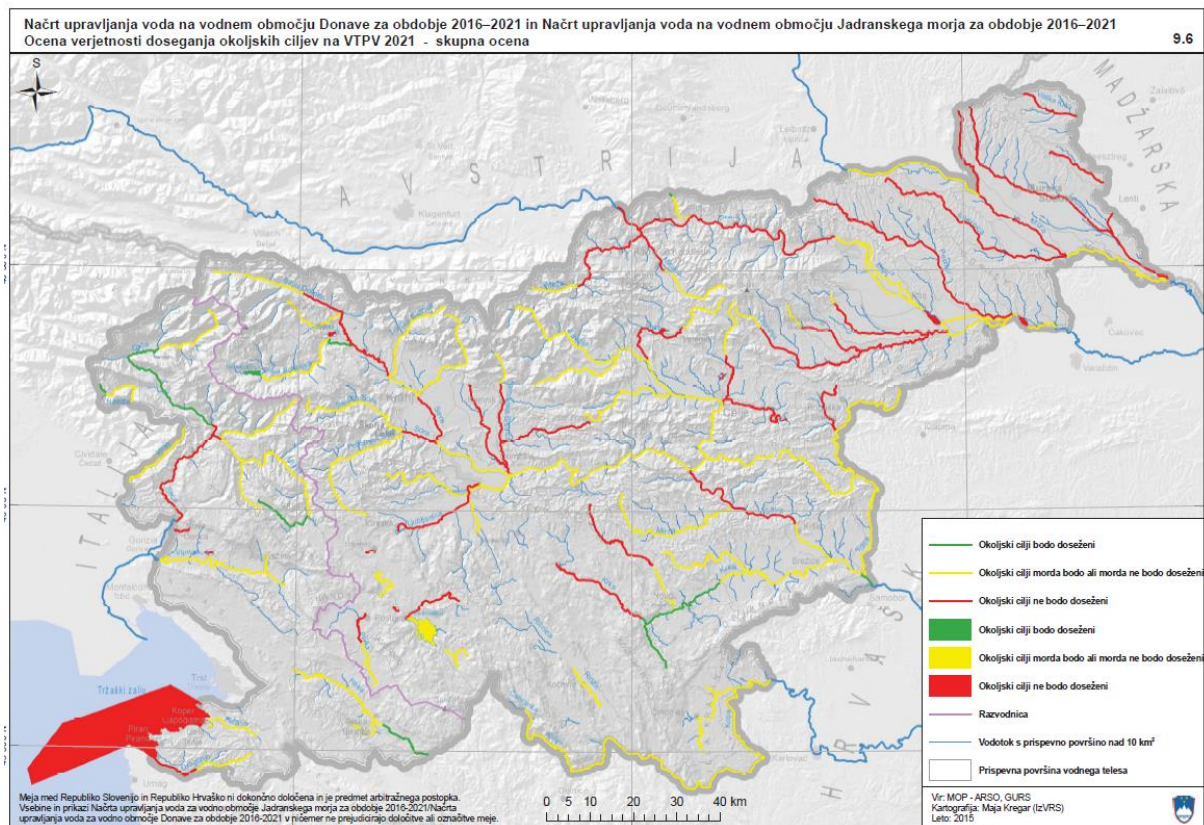


Figure 15: Probability assessment of attaining environmental objectives on surface water bodies in 2021 – overall assessment

Načrt upravljanja voda na vodnem območju Donave za obdobje 2016-2021 in Načrt upravljanja voda na vodnem območju Jadranskega morja za obdobje 2016-2021 Ocena verjetnosti doseganja okoljskih ciljev na VTPV – skupna ocena	Water Management Plan for the Danube River Basin for the 2016–2021 Period and the Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period Probability assessment of attaining environmental objectives on surface water bodies – overall assessment
Okoljski cilji bodo doseženi	Environmental objectives will be attained
Okoljski cilji morda bodo ali morda ne bodo doseženi	Environmental objectives may or may not be attained
Okoljski cilji ne bodo doseženi	Environmental objectives will not be attained
Okoljski cilji bodo doseženi	Environmental objectives will be attained
Okoljski cilji morda bodo ali morda ne bodo doseženi	Environmental objectives may or may not be attained
Okoljski cilji ne bodo doseženi	Environmental objectives will not be attained
Razvodnica	Watershed

²⁴ Water Management Plan for the Danube River Basin for the 2016–2021 Period, October 2016.

²⁵ Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period, October 2016.

Vodotok s prispevno površino nad 10 km ²	Watercourse with catchment area above 10 km ²
Prispevna površina vodnega telesa	Catchment area of water body
Meja med Republiko Slovenijo in Republiko Hrvaško ni dokončno določena in je predmet arbitražnega postopka. Vsebine in prikazi Načrta upravljanja voda za vodno območje Jadranskega morja za obdobje 2016-2021/Načrta upravljanja voda za vodno območje Donave za obdobje 2016-2021 v ničemer ne prejudicirajo določitve ali označitve meje.	The border between the Republic of Slovenia and the Republic of Croatia is not fixed and is subject to arbitration. The content and presentations in the Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period/Water Management Plan for the Danube River Basin for the 2016–2021 Period do not in any way prejudice the determination or marking of the border.

The Programme for Water Management Measures for implementing objectives defined in NUV was adopted by the Government of the Republic of Slovenia in October 2016²⁶. It represents a selection of fundamental and supplementary measures to attain environmental water objectives on surface and groundwater bodies, which are divided into three groups (so-called fundamental measures 'a', fundamental measures 'b' and supplementary measures).

The fundamental measures 'a' include measures that are already being implemented on the basis of applicable legislation and govern the fields of water, environmental protection, conservation of nature and fisheries. The measures derive from the Slovenian legislation regarding the protection of surface and groundwater, water management, use of surface water and groundwater, and economic instruments. These are measures of the common water policy that in compliance with the provisions of the Water Framework Directive (2000/60/EC) were observed when drafting NUV.

The fundamental measures 'b' are measures not yet fully implemented regarding the requirements of the applicable legislation and supplement or upgrade the activities arising from fundamental measures 'a', and eliminate recognised, legal, administrative or expert research gaps.

Supplementary measures are measures needed in order to attain good water status. The measures for surface water bodies and groundwater bodies are determined on the basis of the probability assessment that environmental objectives will not be attained in 2021.

Groundwater

Aquifers with granular porosity prevail in flat sections of river valleys, frequently referred to as alluvial aquifers. The impact on these aquifers is the greatest because of the intensity of human activities such as agriculture, industry, traffic, dense population and waste landfills.

Aquifers with karstic and fissure porosity prevail in the Alpine regions and in the Karst. These aquifers, especially karstic ones, are very vulnerable, but in Slovenia are relatively naturally protected. The majority of aquifers with karstic and fissure porosity are located in mountainous and less populated areas overgrown with forest.

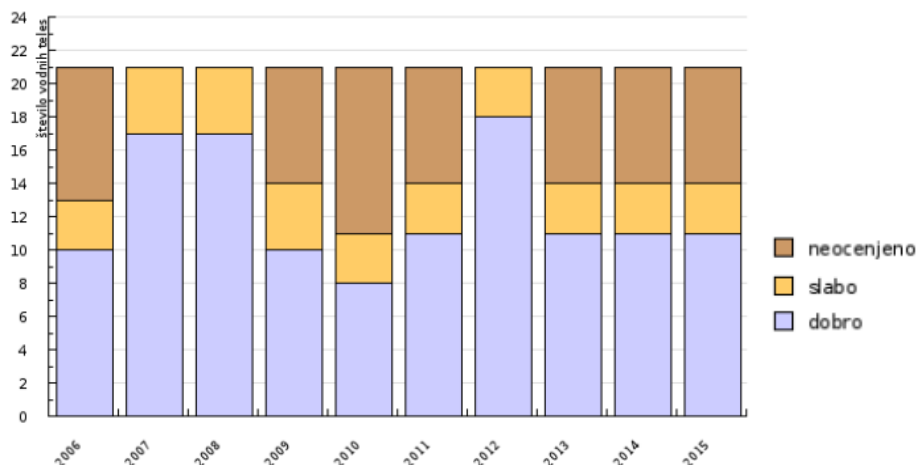
Groundwater quality

The chemical status of groundwater bodies for the 2009–2013 period: A poor chemical status has been established for water bodies comprised of aquifers with granular porosity in the Savinja, Drava and Mura basins. The level of confidence in the assessment of chemical status for these water bodies is high. The reason for poor chemical status of these water bodies is nitrate, and also atrazine in the case

²⁶ Programme for Water Management Measures, October 2016.

of the Drava basin. A statistically significant trend in reducing the nitrate content was established in all three water bodies, and consequently water bodies could gradually obtain good chemical status.

The chemical status of groundwater bodies in Slovenia for the 2006–2015 period is shown in the figure below.



Vir: Enotna zbirka podatkov monitoringa kakovosti voda, Agencija RS za okolje, 2016

Figure 16: Chemical status of groundwater bodies (GB) by years in the 2006-2015 period

Število vodnih teles	Number of water bodies
Neocenjeno	Not assessed
Slabo	Poor
Dobro	Good

Quantitative groundwater recharge

Minimum recharged quantities and simultaneously maximum time variabilities in annual groundwater recharge in shallow aquifers are assessed in groundwater bodies of northeastern Slovenia. The average recharge of aquifers in the area of the Goričko Hills has been more than 10 times lower in the last decade than the recharge of aquifers in the Julian Alps. In addition to this great spatially variable aquifer recharge, great time variability has also been typical in the last decade. Indexes of annual recharge regarding the average of the 1981–2010 period have reached a wide range of annual recharge quantities, which points to a great quantitative sensitivity of groundwater in shallow aquifers of Slovenia.

The total renewable groundwater quantity was in shallow aquifers of Slovenia under the average of the 1981–2010 period in the hydrological year of 2016. The largest negative deviations from the average of the 1981–2010 period were in the hydrological year of 2016 in water bodies of the Mura basin and eastern Slovenske gorice Hills, while there were hardly any deviations elsewhere.

A probability assessment of attaining environmental objectives on groundwater bodies was made for the Water Management Plans for the Danube River Basin and the Adriatic Sea Water Area under the condition that measures of the Programme for Water Management Measures will be implemented in the 2016–2021 period. It is evident from the assessment shown in figure below that the attainment of environmental objectives on groundwater bodies is under threat particularly because of implementing agricultural production.

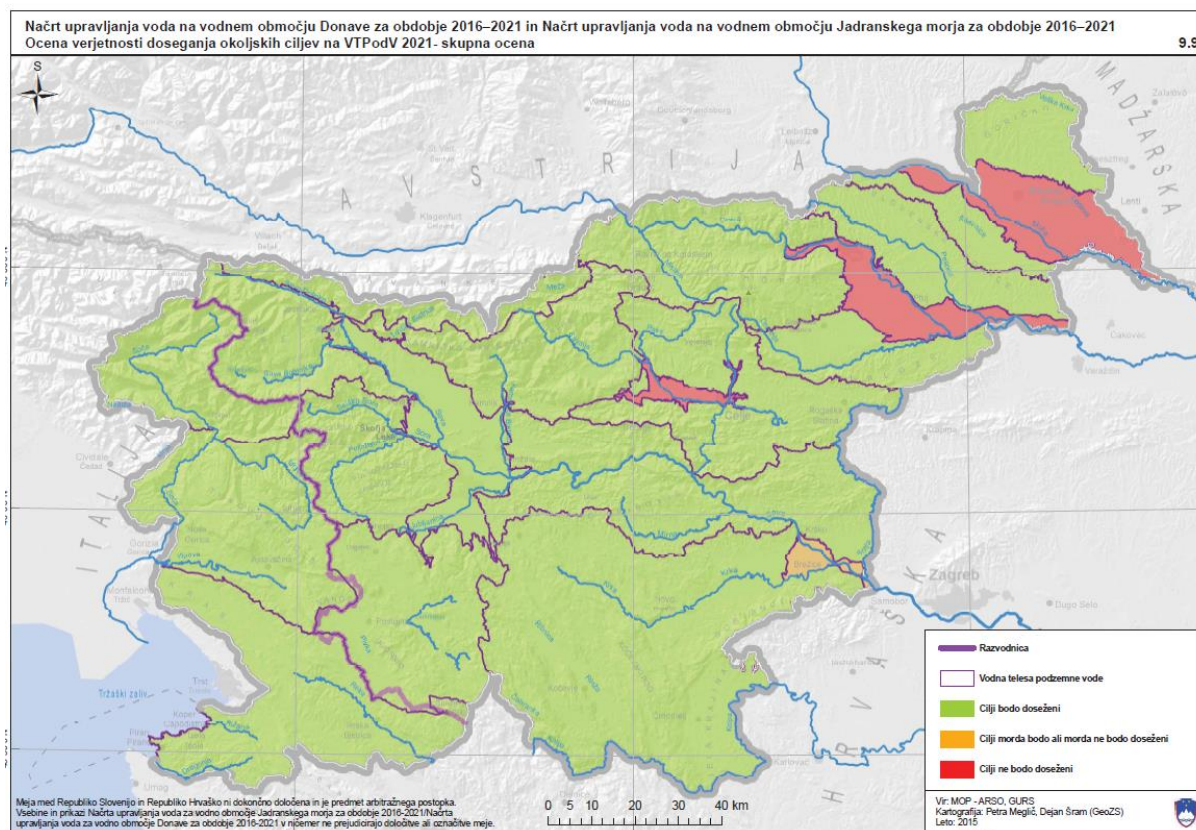


Figure 17: Probability assessment of attaining environmental objectives on groundwater bodies in 2021 – overall assessment

Načrt upravljanja voda na vodnem območju Donave za obdobje 2016-2021 in Načrt upravljanja voda na vodnem območju Jadranskega morja za obdobje 2016-2021 Ocena verjetnosti doseganja okoljskih ciljev na VTPV – skupna ocena	Water Management Plan for the Danube River Basin for the 2016–2021 Period and the Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period Probability assessment of attaining environmental objectives on surface water bodies – overall assessment
Razvodnica	Watershed
Vodna telesa podzemne vode	Groundwater bodies
Cilji bodo doseženi	Objectives will be attained
Cilji morda bodo ali morda ne bodo doseženi	Objectives may or may not be attained
Cilji ne bodo doseženi	Objectives will not be attained
Meja med Republiko Slovenijo in Republiko Hrvaško ni dokončno določena in je predmet arbitražnega postopka. Vsebine in prikazi Načrta upravljanja voda za vodno območje Jadranskega morja za obdobje 2016-2021/Načrta upravljanja voda za vodno območje Donave za obdobje 2016-2021 v ničemer ne prejudicirajo določitve ali označitve meje.	The border between the Republic of Slovenia and the Republic of Croatia is not fixed and is subject to arbitration. The content and presentations in the Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period/Water Management Plan for the Danube River Basin for the 2016–2021 Period do not in any way prejudice the determination or marking of the border.

Marine environment

Directive 2008/56/EC of the European Parliament and of the Council on establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) was adopted in 2008. The objective of this Directive is to attain good environmental status of European seas by 2021. For this purpose, Member States had to adopt suitable measures by 2015, by means of which they will attain or preserve a good status of marine environment.

As per the Marine Strategy Framework Directive, the Marine Environment Management Plan 2017–2021 was adopted in 2017²⁷. The Marine Environment Management Plan includes:

- the assessment of seawater status, including the description of key features and characteristics of the marine environment, determining the objectives and good condition of marine environment, determining anthropogenic pressures on marine environment and the socio-economic analysis of the marine environment,
- seawater monitoring programme, and
- the programme of measures to attain good status of marine environment.

In the Marine Environment Management Plan 2017–2021, the programme of measures is drafted in such a way that it refers to 11 descriptors determining good status of marine environment. The programme of measures discusses activities causing various pressures and subsequent impact due to pollution from sources on land, pollution with waste, microbiological pollution, potential oil spills as a result of accidents and long-term pollution due to vessel traffic and diffuse pollution due to agricultural activity, which cause physical losses of natural areas in the riparian zone, physical damage to the seabed and increase underwater noise. Furthermore, the impact of commercial fishing and the introduction of non-indigenous species is also included.

First assessment of status of the maritime environment

In the Marine Environment Management Plan 2017–2021, the status of the maritime environment is described by means of 11 descriptors: biodiversity, non-indigenous species, fish stock of commercial fish species and shellfish, elements of the marine food webs, eutrophication, sea-floor integrity, hydrographical conditions, environmental pollution, contaminants in fish and other seafood, underwater noise, and marine litter. Criteria and indicators are prescribed for each descriptor. Starting points for criteria and indicators are provided in Commission Decision on criteria and methodological standards on good environmental status of marine waters (2010/477/EU).

Assessments of the status of the marine environment, selections of indicators and objectives were for the most part drafted on the basis of scarce existing data, certain additional research and existing knowledge and studies, which is not a guarantee for high reliability of assessments. Thus, for example, the comprehensive assessment of the status of *biodiversity* is not provided due to the lack of data. The status of species is currently determined at the level of Slovenian sea. The shallow coastal waters have been researched the most, which are very productive and for which great biodiversity is typical. Good status of distribution and size and the status was determined for habitats of infralittoral and circalittoral on hard bottoms and infralittoral and circalittoral sedimentary bottoms, and the water column habitat, while the status of habitats of rocky bottom in the intertidal zone and sedimentary bottom in the intertidal zone for all three criteria was assessed as poor. The state of the jellyfish habitat in water column was also assessed as poor.

Likewise, a comprehensive assessment of the status of marine environment relating to the presence of *non-indigenous species* is not given due to the lack of data. On the basis of the existing data and the first evaluation of the status of marine environment, it was assessed that the status of non-indigenous species in Slovenian sea was good and stable and that they were present in such numbers and to such extent that they did not endanger indigenous species, did not change the habitats and did not weaken genetic characteristics of native species. Nevertheless, there may be the possibility that these

²⁷ Marine Environment Management Plan 2017–2021, May 2017.

assessments of the status were overrated since considerably more non-indigenous species were detected in the nearby surrounding area (the Adriatic and Mediterranean Sea).

Assessments of *fish stock of commercial fish species* were performed at the regional level and adopted within the Scientific Advisory Committee (SAC) of the General Fisheries Commission for the Mediterranean (GFCM). The status of marine environment as per the fish stock of commercial fish species was assessed as poor because it was determined that the stock of sole (*Solea solea*) was subject to overfishing, while the stocks of pilchard (*Sardina pilchardus*) and European anchovy (*Engraulis encrasicolus*) were fully exploited, while the status of stock of other species has not yet been determined. It is not possible to provide a comprehensive assessment of the environmental status since this is sensible to be made at the level of the region.

Numerous anthropogenic pressures, particularly fishing and eutrophication, construction of underwater structures, climate changes and the introduction of non-indigenous species impact the changes to *marine food webs*. The mezozooplankton biomass received a good assessment of the status with high reliability, while on the other hand, scyphozoan jellyfish obtained a poor assessment of the status with medium level of reliability. Due to the lack of data and knowledge about the nutrition ecology of key species and trophic levels, it was not possible to provide a comprehensive assessment of the environmental status.

Nutrient pollution or eutrophication is of anthropogenic origin. Most nitrogen emissions come from land-based sources, such as municipal and industrial wastewater, agriculture, urbanisation of coastal areas and mass tourism. The first assessment of the status of marine environment revealed that the state of the Slovenian sea as per the level of eutrophication was good, although species composition of phytoplankton, macroalgae and marine phanerogams at some places points to excess burdening of the coastal strip of the sea with nutrients. Due to the lack of historical data on concentrations of nutrients in Slovenian sea, the status will have to be compared with other areas in the Northern Adriatic.

Marine fishing (fishing with bottom-set gillnets and bottom trawls) and maritime transport (anchoring, resuspension of the sediment, deepening of navigation channels) contribute greatly to the damage of *sea bed*. On the basis of existing data and the first evaluation of the status of marine environment, it was determined as per the damage to sea bed that the scope of damage due to human activities in Slovenian sea was not negligible and that the status poor. In spite of considerate damage to sea bed, it was established that the status of benthic communities was good; however, the assessment applies only for a section of the coastal strip (infralittoral sedimentary bottom). The comprehensive assessment of the status relating the integrity of marine environment is not yet possible due to the lack of data.

The only area in the Slovenian sea where permanent changes occurred to *hydrographic conditions* of somewhat significant dimensions is the internal section of the Bay of Koper, to which changes in the circulation of fresh seawater and changed regime in the input of fresh water and nutrients contributed. Permanently changed habitats that would exceed 0.5 km² are few and include individual areas in the Bay of Piran (marinas, bathing sites). Due to insufficient data, a comprehensive assessment of the status of hydrographic conditions is not possible yet.

Emissions of *pollutants* and hazardous substances are the result of different human activities and are recorded as coming directly from land-based sources or from rivers (industry, urbanisation, agriculture). Other offshore sources include pollution from ships, offshore terminals (oil, natural gas), mineral extraction and atmospheric disposition. Relating to concentration of relevant pollutants, the environmental status was assessed as poor due to excess concentrations of tributyltin compounds (TBT). Concentrations of other pollutants are below values that could have a negative impact on organisms. The comprehensive assessment of the status relating the pollution of marine environment with pollutants is not possible due to the lack of data.

Maritime transport, tourism, industry, settlement and agriculture in coastal municipalities contribute the most to the pollution of marine environment with pollutants and as a result to the *presence of pollutants in marine organisms*. It was determined that pollutants in marine organisms intended for human consumption and caught in Slovenian sea do not exceed values of concentrations that could be harmful for human health, and thus the status was assessed as good, but the reliability of the assessment is medium. A comprehensive assessment of the status for pollutants in fish and other seafood has not been possible yet since insufficient data on catches in Slovenian sea is available to provide a reliable assessment.

The ecosystem of coastal waters and the sea is harmed by quantities of *marine litter* and their properties, i.e. solid waste of anthropogenic origin. The majority of waste is from plastic materials and derives from outdoor activities (settlement, tourism, industry) and activities in the sea (fisheries, mariculture, shipping). The assessment has shown that waste on the coast and in the maritime environment appear to such extent that overburdening of the environment is detected whereby the trend of reducing waste on the coast can be noted. A comprehensive assessment of the status of pollution of maritime environment with solid waste of human origin is not possible at this point since insufficient data is available for a reliable assessment.

Maritime transport, tourism, ports and marines have a significant impact on burdening the marine environment with *underwater noise* in the Slovenian sea, while sonars, developments in coastal waters and settlement are the main sources of burdening the maritime environment with impulse noise. The first assessment of the status of marine environment with regard to burdening with underwater noise is inconclusive since initial measurements of underwater noise do not provide suitable data. Nevertheless, the first measurements of underwater noise in the Slovenian sea revealed that values of continuous underwater noise are rather high and have a direct impact on behavioural characteristics of marine organisms.

The following two exceptions for attaining the objectives of good status of maritime environment are determined in the Marine Environment Management Plan 2017–2021:

- fish stock for commercial fish species (descriptor D3): As per the scope of commercial sea fishing, Slovenia has no significant impact on the status of fish stock, and it has also carried out all measures to reduce the relevant activity. With national measures, Slovenia alone cannot attain good status or environmental objectives in the field of fish stock. Therefore, active joint action at the level of sub-region or region is mandatory;
- pollution of the environment with tributyltin compounds and mercury (descriptor D8): it is assessed that due to the content of TBT, in spite of measures to reduce and gradually eliminate TBT, the status of marine environment is poor because of natural conditions that do not allow timely improvement of status of the environment. Excessive levels of mercury were detected in the marine environment, which to a great extent were the result of old burdens. It is assessed that the status of the environment is poor due to natural conditions which do not permit timely improvement of the environment.

As per Directive 2008/56/EC, the content of the Marine Environment Management Plan is updated in 6-year cycles, i.e. the updating within following deadlines:

- the assessment of seawater status in 2018²⁸, including the description of key features and characteristics of the marine environment, determining the objectives and good condition of marine environment, determining anthropogenic pressures on marine environment and the socio-economic analysis of the marine environment,
- seawater monitoring programme in 2020,
- programme of measures to attain good status of marine environment in 2022.

²⁸ Update of the assessment of the status of seawater in the jurisdiction of the Republic of Slovenia for quality descriptors D5 (eutrophication), D8 (pollutants), D10 (waste) and D11 (underwater noise); February 2019.

Flood areas

Floods threaten more than 3,000 km² or just under 15% of the country's territory. Half of the flood areas are located in the Sava River basin, 40% in the Drava River basin and 4% in the Soča River basin. Torrent ravines, valley floors and built alluvial plains are especially at risk. Floods that occur due to tidal seawater and karst floods are less extensive. In some flood areas, meadows and pastures have been converted to cultivated land, while some locations were built up. In 1991, 7% of Slovenia's population resided in an area of regular flooding, while one quarter of the population reside on so-called major flood areas (ARSO, 2014).

A rise in the sea level by 1 mm/year was also recorded. Between 1960 and 2006, the sea level reached flood point (300 cm) 306 times. Frequent sea flooding occurs in autumn and winter, and occasionally, in spring, and the number is rising. The most extensive flood area is in the Municipality of Piran. Some 2.5% of the population of coastal municipalities is at risk in the event of extreme floods (ARSO, SOER. The European Environment State and Outlook Report 2010).

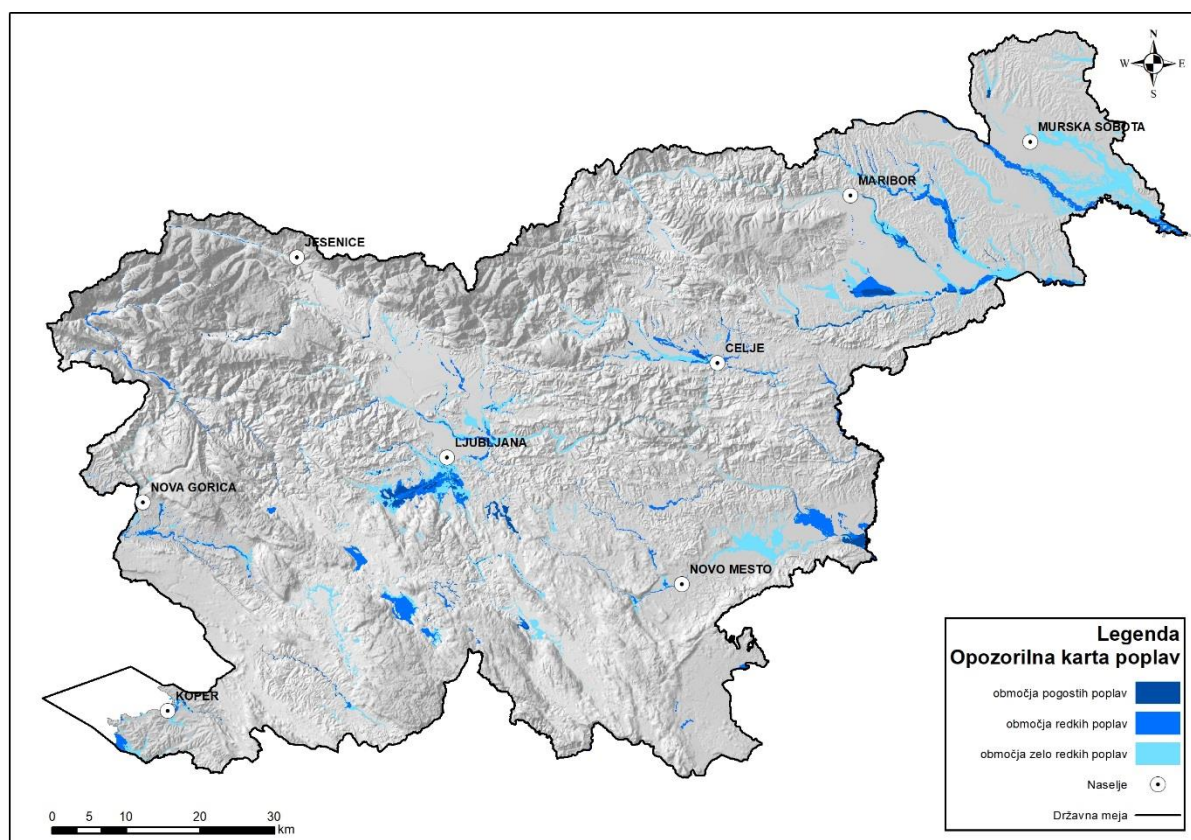


Figure 18: Warning map of floods (data source: Geoportal ARSO, 2019)

Legenda	Legend
Opozorilna karta poplav	Warning map of floods
Območja pogostih poplav	Areas of frequent flooding
Območja redkih poplav	Areas of rare flooding
Območja zelo redkih poplav	Areas of very rare flooding
Naselje	Settlement
Državna meja	State border

Within the first cycle of implementing the EU Floods Directive (2007/60/EC), whose purpose is to establish a framework for the assessment and management of flood risk in order to reduce harmful

consequences of floods on human health, the environment, cultural heritage and economic activities, Slovenia prepared and adopted the document, Preliminary Flood Risk Assessment for the Republic of Slovenia²⁹, defined areas of important flood impact and prepared flood hazard maps and flood risk maps for them, and drafted the Flood Risk Reduction Plan³⁰.

In 2016, the execution of the second cycle of implementing Directive 2007/60/EC commenced. The first activity involved a review and an update of the document, Preliminary Flood Risk Assessment, and an update and verification of the existing areas of important flood impact and determination of possible new areas of important flood impact.

In addition to information from the first assessment (from 2011), the updated Preliminary Flood Risk Assessment (made in 2019) also includes:

- new and additional records and descriptions of flood events with different types of harmful consequences (for the period of floods after 2011);
- upgraded analysis of maximum flow rates in the Republic of Slovenia;
- additional graphic representations of recorded floods in the past;
- verification of the climate change impact on flood characteristics or flood risk in Slovenia; and
- verification and upgrade of determining areas of important flood impact (expansion of the existing selection of important flood impact areas).

As per six categories of vulnerability (human health, cultural heritage, the environment, economic activities, social and economic public infrastructure) and other updates, 53 existing areas of important flood impact were verified and analysed, and 21 new or additional important flood impact areas were determined or proposed by the Municipality of Ljubljana and 12 new or additional ones by local communities and the Slovenian Water Agency (DRSV). The updated selection thus includes 86 important flood impact areas that are displayed on the map below (MOP, 2019).

²⁹ Preliminary Flood Risk Assessment for the Republic of Slovenia, December 2011.

³⁰ Flood Risk Reduction Plan 2017–2021 (NZPO SI), July 2017.

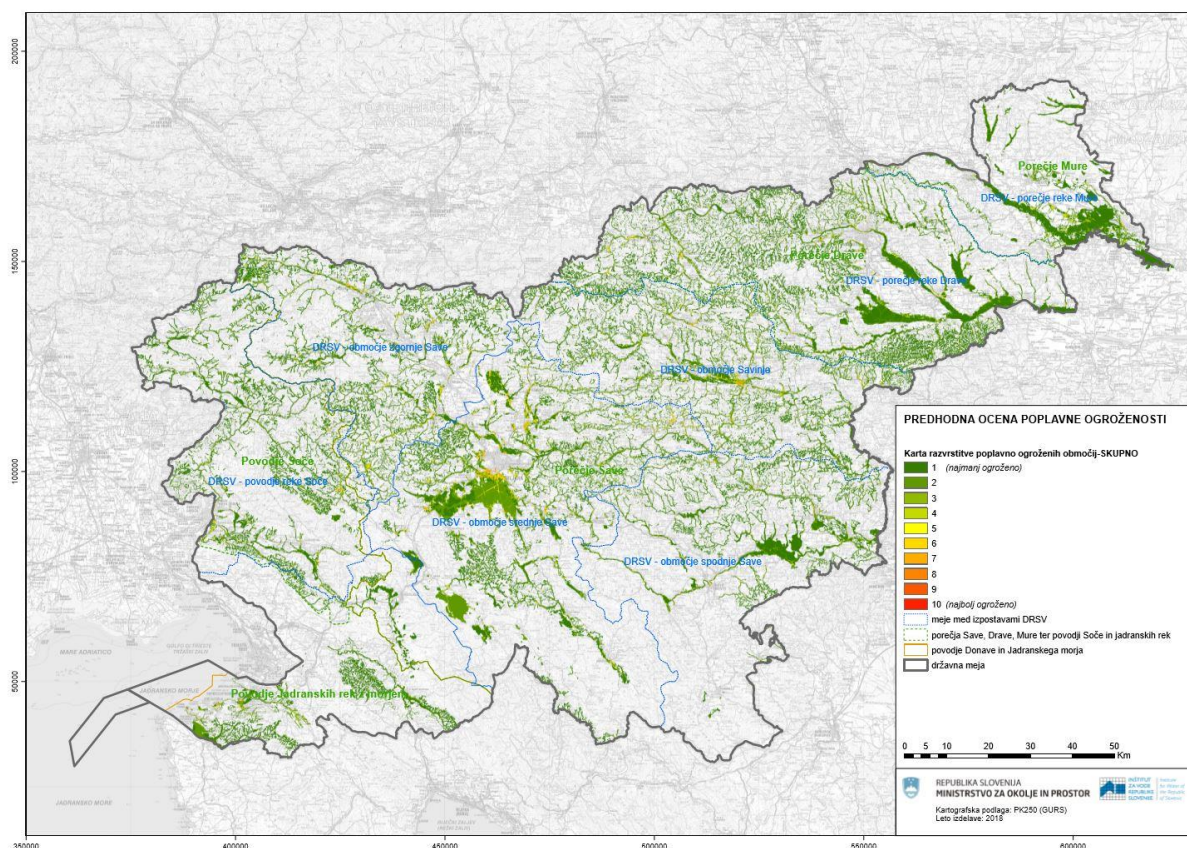


Figure 19: Updated Preliminary Flood Risk Assessment – 2019.

Predhodna ocena poplavne ogroženosti	Preliminary Flood Risk Assessment
Karta razvrstitve poplavno ogroženih območij SKUPNO	Map classifying flood risk areas TOTAL
(najmanj ogroženo)	(least at risk)
(najbolj ogroženo)	(most at risk)
Meje med izpostavami DRSV	Limits between branch offices of the Slovenian Water Agency
Porečje Save, Drave, Mure ter povodij Soče in jadranskih rek	River basins of the Sava, the Drava, the Mura, the Soča and the Adriatic rivers
Povodje Donave in Jadranskega morja	River basins of the Danube and the Adriatic Sea
Državna meja	State border

4.2 NATURE

Biodiversity

Exceptionally great biodiversity at the species, ecosystem and genetic level are typical of Slovenia. Four biogeographical areas come in contact on our territory: the Alps, the Dinaric Alps, the Pannonian Plain and the Mediterranean. The diversity of climate and soil types is accordingly varied. Such great biodiversity is primarily the result of convergence of various types of climate, geological structure and large altitude differences, while it is also connected to a large extent with the traditional agricultural use. This is home to species with highly diverse areas of geographical distribution (eastern European, Eurasian, western European, Mediterranean and numerous endemic species of the western Dinarides).

The abundance of species is particularly found in invertebrate groups; and among vertebrate groups, an important (vital) share of the population of some European or the world's most endangered charismatic species is present in this area.

It has been estimated that some 60% of the environment is natural or semi-natural, including landscapes and areas which were previously managed in a traditional way and where activities were abandoned long ago (MOP, 2010). Natural and semi-natural ecosystems are relatively well preserved. Quite large, dense and well-preserved forest stands with vital populations of large mammals (brown bear, wolf, lynx) are also typical. On a global scale, Slovenia has one of the most biodiverse underground systems, and with more than 58% of forest cover (with well-preserved species), is one of the most forested countries in Europe (MOP, 2010). The climax vegetation in more than 90% of Slovenia's territory would represent forests if human activity did not severely affect the formation of primary landscape. Due to deforestation, use of soil for agricultural purpose, drainage of wetlands, urbanisation and other activities, the area of natural ecosystems is greatly reduced at the account of new ecosystems particularly with regard to agricultural landscape and thus related habitat types (Hlad and Skoberne, 2001). Some 514 natural and anthropogenic habitat types were recorded in Slovenia as per the third level of Palearctic classification (Jogan et al., 2004).

There are some 26,000 species of living organisms in the territory of Slovenia, with estimates of all potential species ranging from 45,000 to 120,000, of which 800 animal and 66 plant species are endemic.

There are 3,266 various indigenous taxa of tracheophytes and phanerogams described for Slovenia; their basic character is defined with Alpine and Central European floristic elements and Pannonian, Dinaric and Mediterranean species. The abundance of species is associated with the diversity of habitat types, which is in turn dependent on various factors ranging from the natural-geographic (range of heights above sea level, solar irradiation, geological makeup) to the florogenetic and, finally, purely anthropological (intensity of impacts on nature, urbanisation, extensive farming, etc.). Parts of western Slovenia (a major part of the Alps and the Slovenian sub-Mediterranean with the Karst and parts of Istria) show significantly greater diversity than the central and eastern parts. The western parts namely have approximately 140 km² of surface area in four quadrants that together form the basic field and are home to 800 or more taxa (MOP, 2010). There are many endemic plants (66 taxa, 22 are unique to Slovenia) that grow in a very small area and nowhere else in the world. For over 25 plant species, we can no longer confirm that they still grow in Slovenia and are therefore considered to have gone extinct here. The trend of extinction of endangered species is observed in the Slovenian Istria, in the easternmost part of Slovenia in the flood plain of the Mura River, the westernmost part of the Slovenian river basin of the Sava River (Prilipe, Jovsi, Dobrava), as well as in the western Karavanke and the northern branches of the Dinaric region. A slight concentration of extinctions of endangered flora can be observed in the area of Pohorje and Slovenske gorice. On the other hand, quadrants with a seemingly improved status are scattered throughout Slovenia, with some unpronounced density areas in the upper Posočje, eastern Kamnik Alps and Bela krajina (Jogan, 2007).

The conservation status of species and habitat types

The latest report on the conservation status of species and habitat types was made in 2013 and includes assessments for 199 species and 60 habitat types. Of these, 45 habitat types and 149 species are in the Alpine region, while in the continental region there are 39 habitat types and 178 species, and in the Mediterranean region, there are 5 habitat types and 4 species.

Final conservation status of HT:

- 43% of all HT has a favourable conservation status,
- 28% of all HT has an unfavourable conservation status,
- 28% of all HT has a poor conservation status,
- for 1% of all HT the status could not be assessed.

In Slovenia, the best conservation status is in coastal and waterside habitat types and heathland habitats. Given that the pressure on the coast and marine area is quite great, it seems that a favourable assessment of marine, coastal and waterside habitats is contradictory. However, these assessments are based on the fact that most of these areas of habitat types are protected and their favourable status has been guaranteed in the long term. Pressures and threats identified during the single assessments display a poor status of conservation of freshwater habitat types, grassland, moors and marshes. The most common among them were human activities linked to sport and leisure, the changing of hydrographic characteristics of the area, displacement of sand and gravel from streams, alteration and abandonment of agricultural land use and natural succession.

Final conservation status of species:

- 29% of all species has a favourable conservation status,
- 40% of all species has an unfavourable conservation status,
- 11% of all species has a poor conservation status,
- for 20% of all species the status could not be assessed.

More than half of species obtained the final assessment of conservation status as 'unfavourable' or 'poor'. The conservation status of species can be linked to poor conservation status of habitat types. In Slovenia, the most alarming status according to assessments is that of crustaceans, amphibians, reptiles and arthropods. The most common threats and pressures on species are changes in hydrographic features, changes to agricultural land use, urbanisation, pollution and land drainage.

In the 2015 draft report, a conservation status of 244 bird species was assessed, of which the assessment for nesting and wintering periods was made for 19 bird species. Conservation status of populations of bird species:

- status of 18% of populations of species is improving,
- status of 22% of populations of species is worsening,
- status of 20% of populations of species is stable,
- status of 10% of populations of species is unstable,
- status of 30% of populations of species is unknown.

It was determined that the status of 18% of populations of species is improving and that the status of 20% of populations of species is stable, while the status of 22% of populations of species is worsening, and the status of 10% of populations of species was assessed as unstable. The most alarming is the status of certain bird species of agricultural landscape due to intensification of agriculture, and in some cases also the abandonment of land use. Most problematic is the intensification of agriculture, especially early mowing, excessive fertilisation, reducing the share of meadows and wetlands, and thus shrinking the extent and quality of habitats, which is, for example, seen in declining population trends of corncrake and whinchat. The negative trend in the populations of birds was also recorded due to the degradation of a mosaic cultural landscape (e.g. the loss of hedges, shrubs) and the disappearance of meadow orchards. Also problematic is the overgrowing or abandonment of dry meadows, thus reducing the habitat of the rock partridge, tawny pipit and ortolan bunting. Among forest bird species, the problem of forest grouse (hazel grouse, capercaillie), and white-backed and three-toed woodpecker stands out. The key reason for declining populations of these species is grubbing and fragmentation of habitat. Forest grouse populations are declining due to overgrowing of meadows, pastures, forest edges, the deforestation and degradation of characteristic habitat, non-compliance with hunting management plans, and disturbances caused by mass tourism and recreation. Declining populations of white-backed woodpecker and three-toed woodpecker are the result of grubbing of habitat in forests with a large volume of deadwood. Unfavourable conservation status was also recorded for several species dependant on freshwater habitats and wetlands. The most noticeable impact and consequences are those caused by the regulation of low-lying river stretches and their tributaries. Nesting opportunities for the sand martin and common kingfisher have reduced by regulation of embankments. By changing river dynamics, the nesting opportunities of common tern, gull and common kingfisher have also been reduced, while the degradation of gravel bars has affected

the little ringed plover and common sandpiper. The overgrowth of oxbows and drainage of wetlands has had a negative impact on various types of reed beds.

Protected areas

There are 355 Natura 2000 sites, of which 324 sites were determined on the basis of the Habitats Directive, and 31 sites on the basis of the Birds Directive. The sites are determined by the Decree on special protection areas (Natura 2000 areas) (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 49/04, 110/04, 59/07, 43/08, 8/12, 33/13, 35/13 – amended, 39/13 – Constitutional Court Decision, 3/14, 21/16, 47/18). The areas cover 37.46% of Slovenia's territory. The areas are mainly overlapping since more than one half of the areas proposed under the Habitats Directive fall within the proposed special protection areas under the Birds Directive. Forests cover 71% of Natura 2000 areas. Some 5% of agricultural land is above the tree line and 23% of land is being overgrown. There is 1% of water and 2% of area is built up (<http://www.natura2000.si/>).

Currently, Slovenia encompasses: 1 national park, 3 regional parks, 46 landscape parks, 1 strict nature reserve, 56 natural reserves and 1,164 natural monuments. Some 270,184 ha are protected, which is as much as 13.33% of Slovenia's territory (as of June 2019). (<http://www.arso.gov.si/narava/zavarovana%20obmo%C4%8Dja/>).

The areas in Slovenia designated as Ramsar wetlands are: Lake Cerknica and its surrounding area (ID 1600), Sečovlje salt-pans (ID 586) and Škocjan Caves (ID 991). The main objective of the Ramsar Convention is to conserve wetlands, especially wetlands of international importance, through wise use, international cooperation and protection.

Due to their exceptional importance for natural world heritage, Škocjan Caves were added to UNESCO's list of natural and cultural world heritage sites in 1986 (reference number 390). They are a unique natural monument in the area of the classic Karst, where the Reka River has formed an extraordinary mix of caves, collapsed dolines, sinks and one of the largest subterranean canyons in Europe at the contact point where flysch and limestone meet. Such UNESCO status is now also held by ancient and primeval beech forests of the Carpathians and other regions of Europe (Krokar primeval forest and Snežnik-Ždrocle forest reserves).

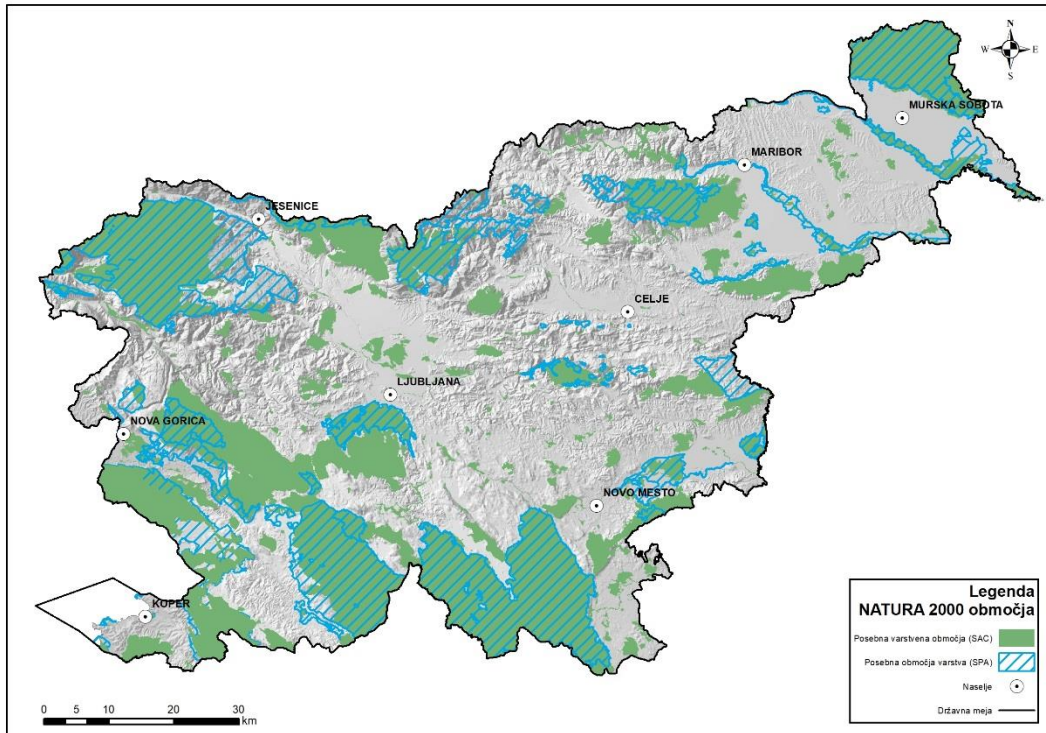


Figure 20: Display of Natura 2000 sites (data source: Geoportall ARSO, 2019)

Legenda	Legend
NATURA 2000 območja	NATURA 2000 sites
Posebna varstvena območja (SAC)	Special conservation areas (SCA)
Posebna območja varstva (SPA)	Special protection areas (SPA)
Naselja	Settlements
Državna meja	State border

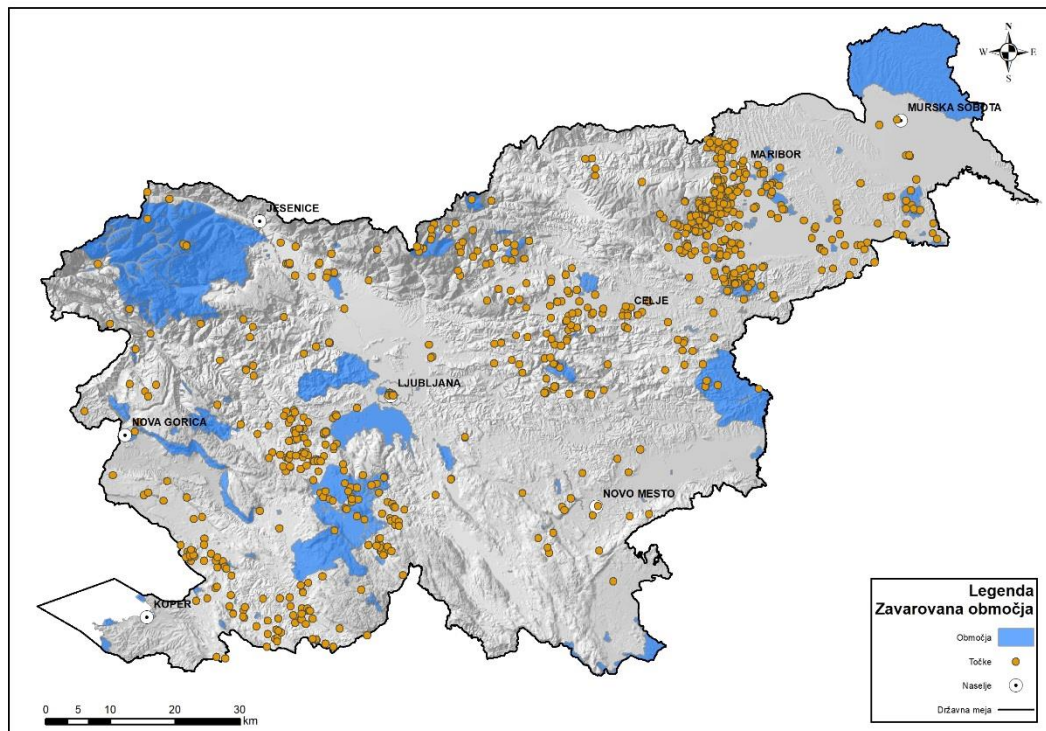


Figure 21: Display of protected areas (data source: Geoportall ARSO, 2019)

Legenda	Legend
Zavarovana območja	Protected areas
Območja	Areas
Točke	Points
Naselje	Settlement
Državna meja	State border

Valuable natural features

Currently, there are 5,283 valuable natural features and 12,148 caves/valuable natural features (ARSO, quoted on 17 July 2019). The total area of all polygons amounts to 2,471.78 km² which represents 12.19% of the country's territory. In terms of surface, the largest geomorphological valuable natural features are the Pokljuka and Jelovica plateaus, followed by the Nanos thrust-fold mountain and the Karst Rim.

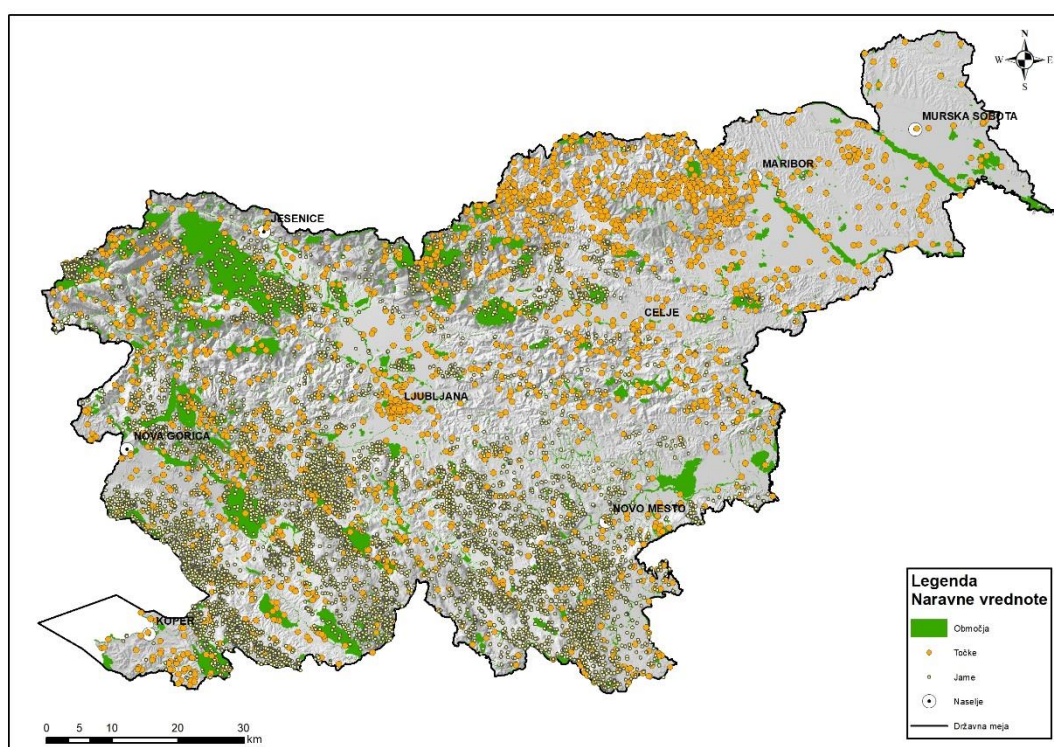


Figure 22: Display of valuable natural values (data source: Geoportal ARSO, 2019)

Legenda	Legend
Naravne vrednote	Valuable natural features
Območja	Areas
Točke	Points
Naselje	Settlement
Državna meja	State border

Ecologically important areas

Slovenia encompasses 305 ecologically important areas and 32 caves designated as ecologically important areas. Ecologically important areas have a total area of 1,336,022.9 ha or 65.9% of Slovenian territory. The majority of ecologically important areas is covered by the central part of the habitat of large carnivores, the Julian Alps and the Kočevsko region.

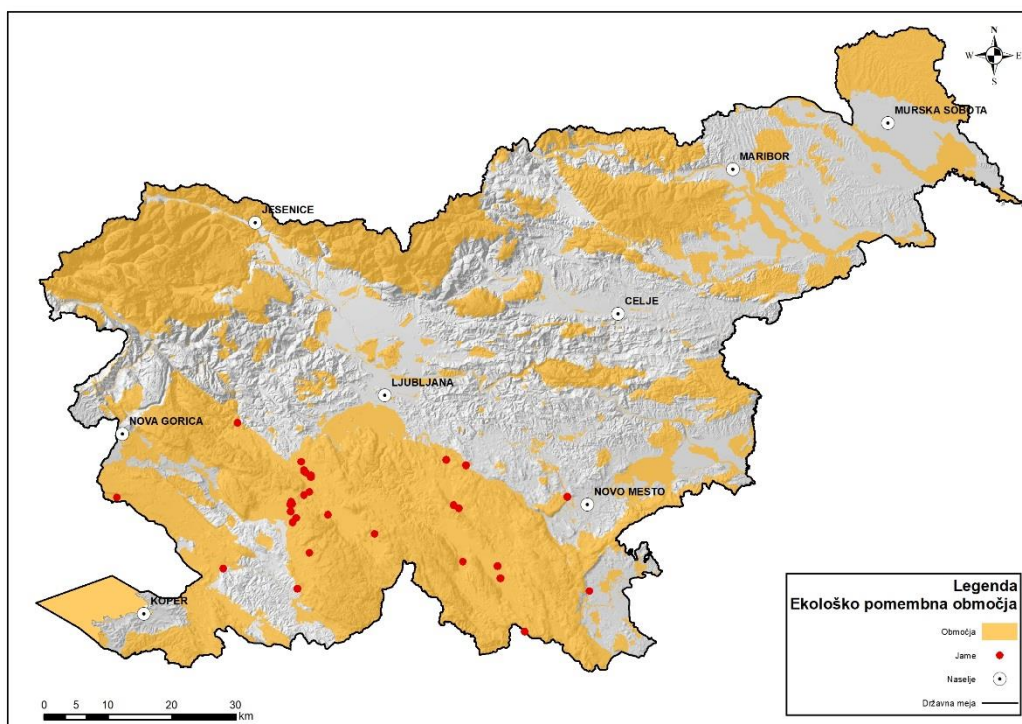


Figure 23: Display of ecologically important areas (data source: Geoportal ARSO, 2019)

Legenda	Legend
Ekološko pomembna območja	Ecologically important areas
Območja	Areas
Jama	Caves
Naselje	Settlement
Državna meja	State border

4.3 CLIMATE FACTORS

Climate change adaptation

The tools for the assessment of future climate and vulnerability of the environment to climate changes include various climate models (source: Bases for drafting the assessment of risks and opportunities ..., 2014; Draft National Strategic Framework for Adaptation to Climate Change, 2016). In its fifth report, the Intergovernmental Panel on Climate Change (IPCC, 2013) minutely presented the scenarios for climate change in the 21st century from the global level to individual regions. The simulation results both in Europe and Slovenia predict a significant rise in air temperature by the end of the century. At the annual level, the range for the most mild scenario is from less than 2°C to about 5°C for the scenario without mitigation of climate change. Summers will be likely warmer than winters. The anticipated change in precipitation is more uncertain, but with a likely increase in the cold and a drop in the warm half of the year. Accordingly, we can expect longer and more intense periods of summer heat and drought.

Great climate diversity is characteristic of Slovenia, since three very different climate types exchange or interact in a very small area: Sub-Mediterranean, Alpine and continental. Due to great climate diversity, the response of individual climatic regions to global warming is different.

From all climate variables, air temperature changed most notably in the 1961–2011 period. An increase in temperature throughout Slovenia is statistically significant. On average, temperature rose by 1.7°C in the discussed period. The trend was spatially and temporally disparate, different also

according to seasons. A pronounced rise in temperature in spring and summer started only in the mid-1980s. The trend has been noted during the entire discussed period in winter, while air temperature in autumn first declined until the end of the 1970s and then began increasing. The air warmed up most in the summer. The eastern part of Slovenia warmed up somewhat more than the western in summer, winter and at the annual level.

Similarly to the average air temperature, both daily temperature extremes rose as well: the lowest and the highest air temperature. The rate of warming in both variables was comparable to the rate of the trend of average temperature. Like in average temperature, a minor difference in warming between the east and the west of the country can be detected in both extreme temperatures.

Changes to temperature climate indicators are noticeable due to changes in temperature extremes. The number of warm days (when highest daily temperature exceeds 25°C) in spring and summer increased significantly, also in the north-east of the country in autumn. The number of hot days (when highest daily temperature exceeds 30°C) increased throughout Slovenia. Very hot days (when highest daily temperature exceeds 35°C) are few in our climate and thus the increase in the number of such days is not statistically significant.

In the cold half of the year, we are interested in extreme cold days: cold (with lowest daily air temperature below 0°C), cool (with lowest daily air temperature below -10°C) and freezing cold days (with highest daily air temperature below 0°C). Quite contrary to the hot extremes, a drop in the number of days is detected for cold extremes. Cold days represent a somewhat mild extreme, which is very important due to the great impact on the vegetation, particularly in spring (frosts) when a statistically significant trend in the decline of such days has been noted throughout Slovenia. There are many cold days in Slovenia in winter and their number has not changed significantly due to global warming in many places. However, their number reduced significantly particularly in the Gorenjska region with the exception of high mountains. The number of cold days in autumn in the north-east part of Slovenia reduced statistically significantly as well.

With the exception of high mountains, cool and freezing cold days are limited to winter. The number of cool days dropped considerably and statistically significantly in Eastern Slovenia, at Kredarica and Rateče, while the change in freezing cold days was less explicit and statistically significant only at a few stations. The number of cool days at Kredarica in winter remained unchanged, while the number of such days in autumn was quite reduced. A significant drop in freezing cold days in autumn was also recorded at Kredarica.

Unlike air temperatures, the changes in precipitation are not so clear. Inter-annual variability of precipitation is much greater than with air temperature, which is why long-term changes (climate change signal) are more difficult to detect. At the annual level, the level of precipitation dropped statistically significantly in many places in the western half of the country. The rate of changes was between 2 and 4% per decade in the 1961–2011 period, at some stations even higher. Thus, the average annual precipitation dropped at some places by more than 20% in the discussed period. At the annual level, a negative trend in the amount of precipitation was detected in the eastern half of the country, but this trend is not statistically significant anywhere.

A more diverse presentation of the precipitation trend is revealed at the level of seasons. A downward trend in precipitation was detected at all stations in spring, but this was statistically significant only on the coast, south Posočje and the extension of the south-eastern edge of the Kamnik-Savinja Alps. The downward trend in precipitation was noted in the south-western half of the country in summer, but it was statistically significant only at the Dinaric barrier. The signal in increasing summer precipitation was detected at some places in the north and north-east, but it is not statistically significant. In autumn, changes in precipitation are not statistically significant anywhere. The signal in decreasing precipitation was noted in the west, north-west, south and far north-east, while the signal in increasing autumn precipitation was seen in Central and Eastern Slovenia. The trend of changes in precipitation is statistically significant in winter only at one station in the Goričko Hills, although a drop in

precipitation in the northern half of the country is quite substantial (up to 9% per decade). The signal in decreasing winter precipitation is substantially smaller in the southern half of the country, and the trend is even positive at some stations at the Dinaric barrier.

Hydrological analyses and studies reveal an increase in high waters in the last two decades. In accordance with this change, it may be expected that precipitation extremes have also changed. The most obvious changes in these precipitation extremes are noticed in the summer, when the heights of these extremes are lower across the country, with the exception of North-western Slovenia; at many weather stations in Central and Eastern Slovenia, this is becoming statistically significant. At some stations, the speed of decreasing 2-day extreme precipitation is very great, up to as much as 10% per decade. The spatial image of changes of 2-day extremes is more diverse in spring and winter. The situation in spring is the opposite of the situation in summer; the strongest signal of decreasing 2-day extreme precipitation is in North-western Slovenia; towards the south and east, it even slightly turns positive at numerous stations – an increase of 2-day extreme precipitation. The signal of changes in 2-day extreme precipitation is not statistically significant anywhere in autumn. In most parts of Slovenia, a slight increase in 2-day extreme precipitation is noticeable. The changes in 2-day extreme precipitation are not statistically significant at any station in winter. It may be noted that the signal is more negative (decreasing of extremes) in the north and north-west of the country, while the trend in changes of extremes is positive in the south and south-west.

The analysis of precipitation events when at least 20 mm of rain falls in one day shows a similar picture than the 2-day extreme precipitation. In spring and summer, the number of such days is lower across the country, but these changes are not statistically significant. The indication of a decrease is lower in spring (only up to half a day per decade) and is not statistically significant. In summer, the signal of decreasing the number of days with at least 20 mm of rain is greater; a reduction by one to two days per decade is noticeable at some weather stations. The signal of decreasing is statistically significant at certain stations in western part of the country. In the west, the signal of decreasing the number of days with at least 20 mm of rain can still be noticed in autumn; however, this signal is not statistically significant. Meanwhile, a trend of such days decreasing is not evident in the east of the country; an opposite trend is even noticed at some weather stations. In winter, the signal in the north-west is again negative (decreasing number of days with at least 20 mm of rain), while the number of days with at least 20 mm of precipitation does not change elsewhere in Slovenia in winter.

Snow cover is significant in the cold half of the year for a large section of Slovenia. This is a very important element in the water balance and also has a great impact on certain economic activities. The depth of snow cover also changes with the rising of temperature. The changes are relatively great and statistically significant in the total depth of the newly fallen snow in the season as well as in the depth of snow cover. In both cases, the changes are statistically significant everywhere in the Dinaric-Alpine barrier and in Northern Slovenia. The exceptions are only certain low-land stations in the south and east and in the Primorska region, of which snow cover is not significant. The changes are most visible at stations in low mountains where a significant share of rainwater was collected in the snow cover in the past and represented a water reserve for late spring and early summer days. Significant changes to this water reserve impact the flow regimes of certain rivers since the impact of snow on the flow regimes is decreasing.

The factors that affect the climate are divided into natural and anthropogenic, with the latter contributing the larger share to the current climate change, which is also very likely to be the case in the future. On the basis of certain assumptions regarding population movement and economic development, the human impact on the climate in the future can be assessed through greenhouse gas emissions and other activities affecting the environment. On this basis, possible climate change scenarios can be modelled.

For Slovenia, detailed scenarios of extreme events are still in preparation. Nevertheless, at least for some extreme weather events we can more confidently talk about the changes. As per the assessment

of climate change in Slovenia (Climate change ..., 2014), the following many be expected by mid-century:

- severe heat in summer due to higher air temperature;
- greater variability of temperature and precipitation in the summer;
- more heavy precipitation events (in general, more water vapour in the atmosphere);
- greater evaporation;
- strengthening of the hydrological cycle – water cycle;
- more frequent current centennial floods (shortening of return periods of extreme precipitation);
- very probable significant increase in the frequency of summer drought;
- probable increase in the number of days with favourable conditions for the emergence of summer storms.

In particular, the assessment of climate change by 2050 (Climate change ..., 2014) points at:

- According to climate scenarios, entire Slovenia will continue to heat up in the future. By mid-century, the average annual temperature will increase by 1.0 to 2.5°C across the country. Spring will warm up least, namely by 0.5 to 1.5°C. Other seasons will warm up slightly more, namely by 1 to 2.5°C.
- Climate scenarios show far greater uncertainty for precipitation than for temperature. Annual precipitation is expected to remain more or less unchanged. The changes are expected to be in the range from –5% to + 5%.
- Similarly, in spring and autumn both decrease and increase in precipitation quantity can be expected. In winter and summer, the signal for changes in precipitation is more certain. In winter, an increase in the precipitation quantity is more probable; in summer, a decrease in the precipitation quantity is very probable, at least for the southern part of the country.

Climate change mitigation

All Member States of the European Community have achieved the objective arising from the Kyoto Protocol first commitment period. The previous members (EU-15) had a joint goal to reduce greenhouse emissions by 8 percent in the 2008–2012 period with regard to emissions in the base year. They exceeded the goal by slightly under 4 percent. All new Member States achieved their Kyoto goals without additional purchases, whereas the Baltic countries exceeded the goal the most. Collectively, Member States (EU-28) reduced their emissions with regard to the base year by 19 percent without considering sink holes and international loans. For achieving the Kyoto goals, Slovenia used the highest permitted number of sink holes and exceeded its goal of 8 percent by 3 percent.

In 2015, total greenhouse gas emissions in Slovenia reached 16,831 Gg (gigagram = 1000 tonnes or kilotonnes) of equivalent CO₂, which is 17.4 percent below the value of 1986, the base year, and 1.3 percent more than in 2014. The energy sector (2.6 percent) and the consumption of fuel in households and the commercial sector (6.9 percent) contributed the most to the increase of emissions. Somewhat lower emissions than in 2014 were recorded by industry and agriculture.

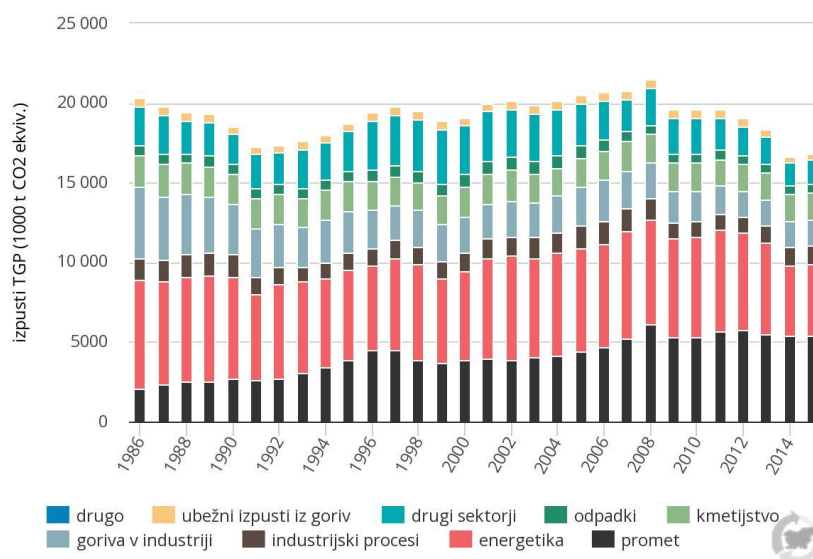


Figure 24: Annual greenhouse gas emissions by sectors in Slovenia in the 1986–2015 period (source: Environmental Indicators in Slovenia, 2017)

Izpusti TGP ...	GHG Emissions (1000 t CO ₂ equiv.)
drugo	Other
ubežni izpusti iz goriv	Fugitive emissions from fuels
drugi sektorji	Other sectors
odpadki	Waste
kmetijstvo	Agriculture
goriva v industriji	Fuels in industry
industrijski procesi	Industrial processes
energetika	Energy
promet	Transportation

In the total share of GHG emissions, the largest share in Slovenia is attributed to CO₂ (as much as 80.8 percent in 2015). CO₂ is generated particularly in the combustion of fuels and industrial processes. It is followed by methane (12.1 percent), which is mainly produced from waste and in agriculture, and nitrous oxide (4.9 percent). Nitrous oxide emissions from road traffic are also quite noticeable. F-gases emissions, including hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulfur hexafluoride (SF₆), are very small, although their contribution due to high greenhouse effect to global warming is not negligible (2.3 percent).

In 2015, forests in Slovenia covered more than 58 percent of the territory and are an important source for reducing greenhouse gas emissions. The calculated sink holes are significant due to the change in the use of land and forestry; in 2015, they were -5,628 kilotonnes CO₂ eq. Despite the importance of forests and carbon sink, Member States will not be able to enforce those sinks to reduce emissions until 2020.

Division in emissions, included in the ETS and those outside the ETS, is important to achieve the EU goals by 2020. Emissions within the ETS, which also includes major electricity and heat producers as well as energy-consuming industry, will be reduced due to the reduction of available emission allowances that will be available at auctions. In 2015, emissions from those devices in Slovenia were reduced by 0.1 percent compared to 2014. Emissions that are not included in emission trading and that can be impacted by the Members States with appropriate measures and policies are especially relevant for Slovenia. These emissions cannot exceed the allocated quantities of allowances as per Decision No 406/2009 and Decision No 634/2013. For Slovenia, this limitation in 2015 amounts to 12,384 Gg CO₂

eq. Slovenian emissions in 2015 amounted to 10,722 Gg Co₂ eq. or 13.4 percent lower than the highest permitted emissions for the same year.

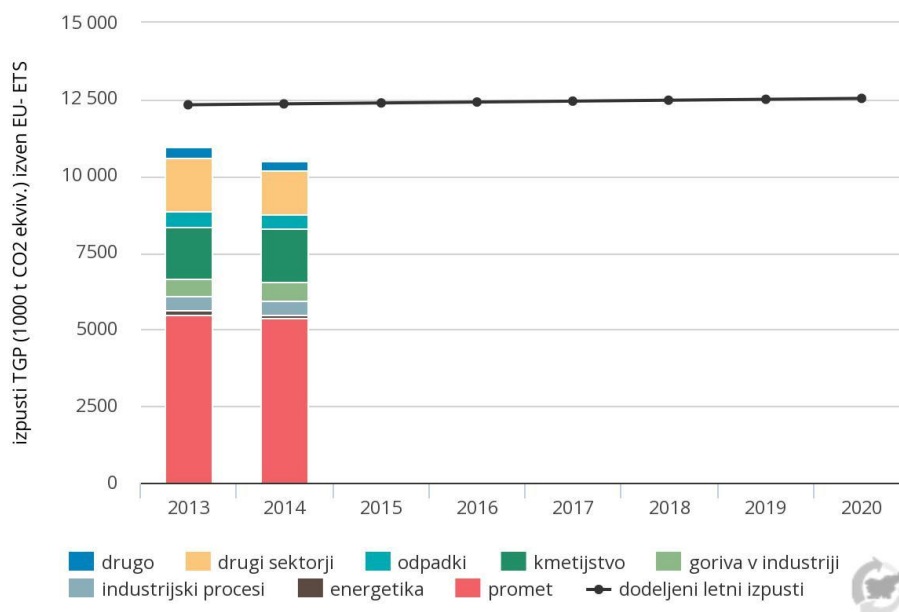


Figure 25: Greenhouse gases emissions outside of EU ETS tradition, by sectors, Slovenia, 2013–2020
 (source: GHG Records, Slovenian Environment Agency (2017), Report on fulfilment of obligations 2005–2014, REK (2017))

Izpusti TGP ...	GHG Emissions (1000 t CO ₂ equiv.) outside EU-ETS
drugo	Other
ubežni izpusti iz goriv	Fugitive emissions from fuels
drugi sektorji	Other sectors
odpadki	Waste
kmetijstvo	Agriculture
goriva v industriji	Fuels in industry
industrijski procesi	Industrial processes
energetika	Energy
promet	Transportation
dodeljeni letni izpusti	Allocated annual emissions

Outside the ETS, the most important sector is transportation, which generated 50 percent of all emissions in 2015. In the transportation sector, most emissions are caused by road transportation, as much as 99.1 percent in 2015. Emissions from transportation increased significantly until 2008, when they were 39 percent higher than in 2005. With the onset of the economic crisis, emissions dropped sharply in 2009 and then rose again in 2011 and 2012. Emissions from transportation were somewhat lower in the 2013–2015 period, which may be ascribed to greater environmental awareness and the use of sustainable mobility; nevertheless, emissions in 2015 were still 21 percent higher than in 2005.

The next important source is agriculture, contributing 16.3 percent of emissions. Compared to 2014, they increased in 2015 by 2.1 percent, although they were still 1.7 percent lower than in 2005. The reason for lower emissions is the intensification of livestock farming and the reduction of the number heads of cattle as well as improved swine manure management.

With a 14.1 percent share, emissions from the use of fuels in households and the commercial and institutional sector are the third most important source outside of the ETS. In 2015, these emissions were 6.9 percent higher than in 2014, although they were 42.5 percent lower than in 2005. In the past few years, this reduction has been significantly impacted by milder winters as well as an increased use of wood for heating, because CO2 emissions from biomass are not considered. All other sources contributing to emissions outside the ETS are: other use of fuels in industry (9.3 percent), waste management (4.9 percent), other process emissions (1.2 percent) and other (fugitive emissions, other energy sector ... 3 percent).

In accordance with the Operational programme to reduce greenhouse gas emissions by 2020 the indicative sector objectives to reduce greenhouse gas emissions in transportation include:

- the rapid rise in greenhouse gas emissions must be halted and reduced by 9 percent by 2020 in comparison with 2008 through the introduction of sustainable mobility measures;
- the trend of increasing greenhouse gas emissions produced by transportation must be reversed to prevent them from increasing by more than 18 percent by 2030 in comparison with 2005; i.e. a 15 percent reduction by 2030 in comparison with 2008;
- a vision of a further emission reduction by 90 percent by 2050 must be integrated into measures for attaining the objectives of the Strategy.

4.4 HUMAN HEALTH

4.4.1 DRINKING WATER

The main source of drinking water in Slovenia is groundwater, which provides the majority of the required water.

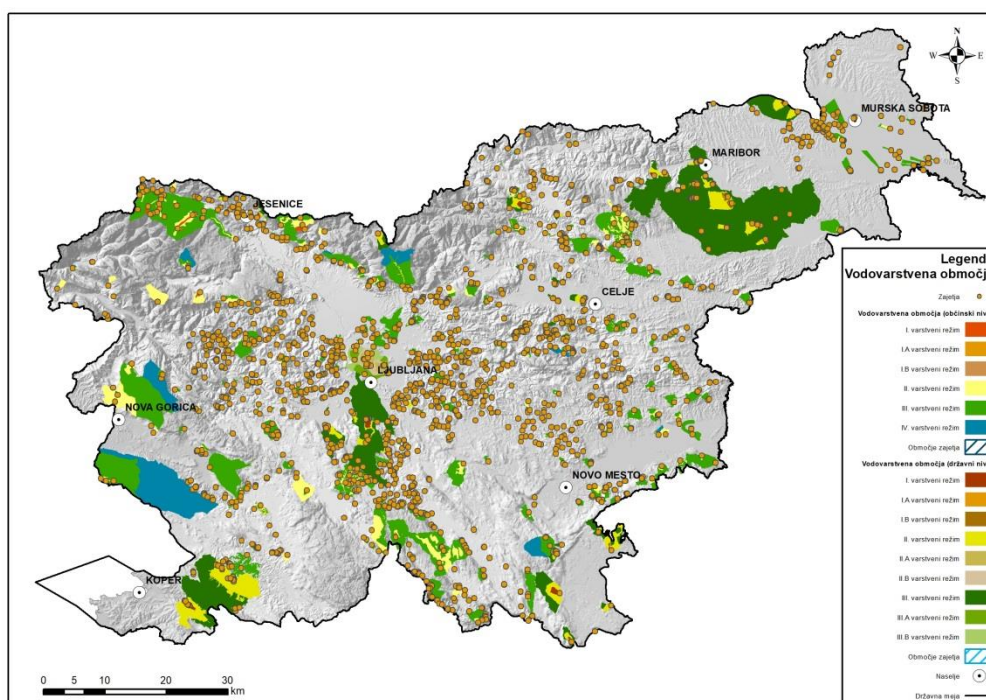


Figure 26: Display of water protection areas (source of data: Geoportalo ARSO, 2019)

Legenda	Key
Vodovarstvena območja	Water protection areas

Zajetja	Reservoirs
Vodovarstvena območja (občinski nivo)	Water protection areas (municipal level)
Varstveni režim	Protection regime
Območje zajetja	Reservoir area
Vodovarstvena območja (državni nivo)	Water protection areas (national level)
Naselje	Settlement
Državna meja	State border

Water protection areas covering approximately 4,491 kms² have been adopted or proposed for water sources in public use in Slovenia, which is approximately 22 percent or one-fifth of the Slovenian territory. An even larger area has potential water sources. The area with captured and potential water sources comprises over a half of the Slovenian territory. Municipal decisions or state regulations and the Rules on criteria for the designation of a water protection zone (Official Gazette of the Republic of Slovenia, nos. 64/04, 5/06, 58/11), which also include protection regimes apply to activities in water protection areas.

4.4.2 AIR QUALITY

The biggest problem in Slovenia regarding air quality is pollution with particulates (PM₁₀) and ozone in the summer. In addition, higher concentrations of lead occasionally occur in the brownfield area of the Meža Valley. Measurements of PM₁₀ show that the limit values are occasionally exceeded throughout Slovenia, especially in the interior, where long-lasting temperature inversions occur. An analysis of the sources of PM₁₀ particulates has shown that the primary cause is the use of heating devices, especially in urban centres with heavy traffic (Ljubljana Basin), while in valleys with little wind (Zasavje and Celje basins), heating devices and industrial sources are an additional source of pollution. Remote transportation from the Padan Plain in Italy contributes significantly to ozone pollution, which is more pronounced in Primorska.

The total number of exceeding values in 2017 at ten measuring sites in the territorial Slovenia (four measuring sites are categorised as urban-transportation, three as urban periphery, two as agricultural-countryside and one as suburban periphery) exceeded 35, which is the limitation for an entire year. Compared to 2016, the permitted number of exceeding values was exceeded fewer times in 2017, where the measured maximum daily levels of PM₁₀ particulates were significantly higher at most measuring sites than in 2016. The highest daily PM₁₀ particulates were measured in January and in the first days of February when the weather was stable, cold and there were extreme temperature changes. The highest number – 57 – of exceeding values were measured in 2017 at the new measuring site on Mariborska cesta road in Celje, where there is heavy traffic. As usual, the number of daily ceilings was not exceeded at measuring sites in Primorska. The annual ceiling of PM₁₀ particulates in 2017 did not exceed the limit value at any measuring site.

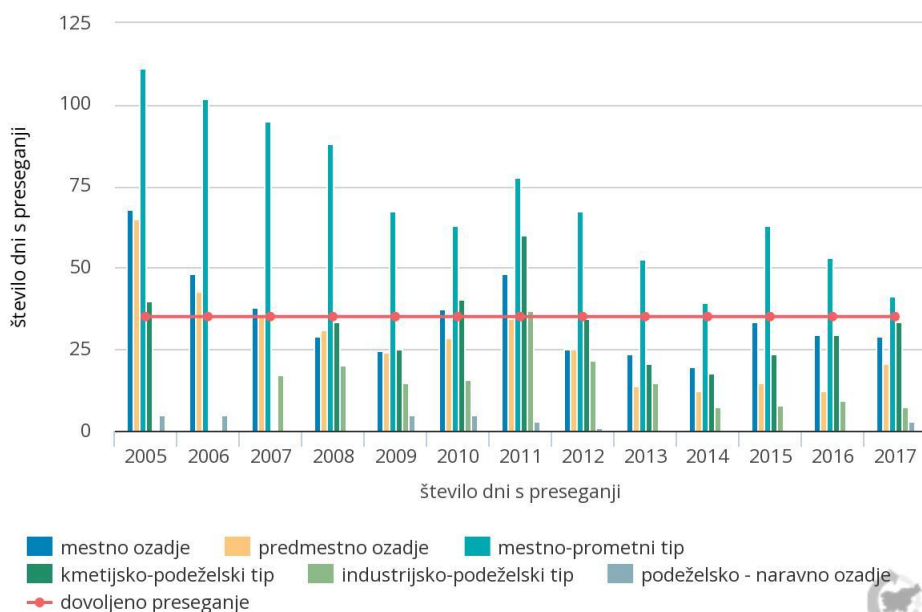


Figure 27: Number of days with the exceeded daily ceiling concentration of PM₁₀ 50µg/m³ (it may be exceeded 35 times in a calendar year) Environmental Indicators in Slovenia, 2019)

mestno ozadje	Urban area
predmestno ozadje	Suburban area
mestno-prometni tip	Urban-transportation type
kmetijsko-podeželski tip	Agricultural-rural type
industrijsko-podeželski tip	Industrial-rural type
podeželsko-naravno ozadje	Rural-natural area
dovoljeno preseganje	Permitted exceeded ceiling
Število dni s preseganji	Number of days of exceeded values

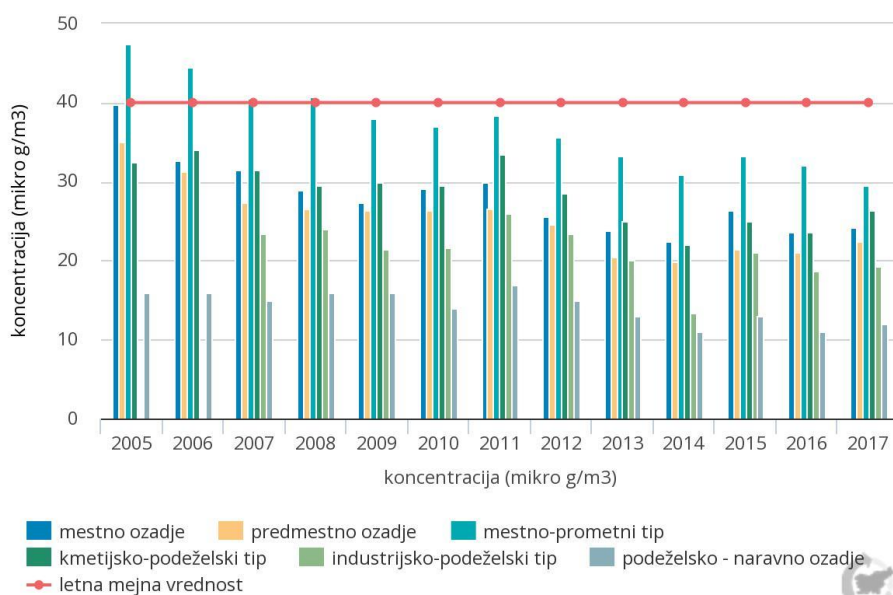


Figure 28: Movement of average annual concentrations of PM₁₀ (annual ceiling is 40µg/m³) (source: Environmental Indicators in Slovenia, 2019)

mestno ozadje	Urban area
---------------	------------

predmestno ozadje	Suburban area
mestno-prometni tip	Urban-transportation type
kmetijsko-podeželski tip	Agricultural-rural type
industrijsko-podeželski tip	Industrial-rural type
podeželsko-naravno ozadje	Rural-natural area
dovoljeno preseganje	Permitted exceeded ceiling
letna mejna vrednost	Annual ceiling
koncentracija (mikro g/m ³)	Concentration (micro g/m ³)

Only the annual ceiling is determined for PM_{2.5} particulates, which is quite beneficial with regard to the specific national circumstances in Slovenia. The levels of particulates in Slovenia are mostly increased in the cold half of the year, while the annual average is lowered with less polluted air in the warm half of the year. Since the beginning of measurements and also in 2017, no ceiling for PM_{2.5} particulates was exceeded at four measuring sites. The annual trends of PM_{2.5} particulates levels show that the pollution level remains at the same level. The average exposure to PM_{2.5} indicator in 2017 at a measuring site in non-exposed urban environment amounted to 22µg/m³ (LJ Faculty of Biotechnology) and 19µg/m³ (MB Vrbanški). The obligation with regard to the exposure level for 2017 was 20µg/m³ and was exceeded in 2017 at the Ljubljana Faculty of Biotechnology measuring site.

In rural areas, concentrations of PM₁₀ particulates are significantly lower. At the Iskrba location that is a natural background, no exceeding of the daily ceiling was recorded in 2015. The most, i.e. 85 exceeded values, were measured in 2015 at the traffic measuring site of Ljubljana Centre. The average annual concentrations of PM₁₀ particulates were higher in 2015 at almost all measuring sites than in 2014.

In the past few years, the level of air pollution with ozone has been above the target and long-term value for most measuring sites as well as in the countryside and at higher altitudes, while the warning value was due to fewer sunny days and a hot summer exceeded in Primorska and in certain areas also at higher altitudes. Due to weather conditions that contribute to ozone and ozone transportation as well as its precursors from northern Italy, the highest concentrations of ozone are in the area of Primorska. In 2015, the ozone target value was exceeded most frequently in Koper (62 days) and Nova Gorica (48 days), it was exceeded for 30 days in Ljubljana and 22 days in Murska Sobota.

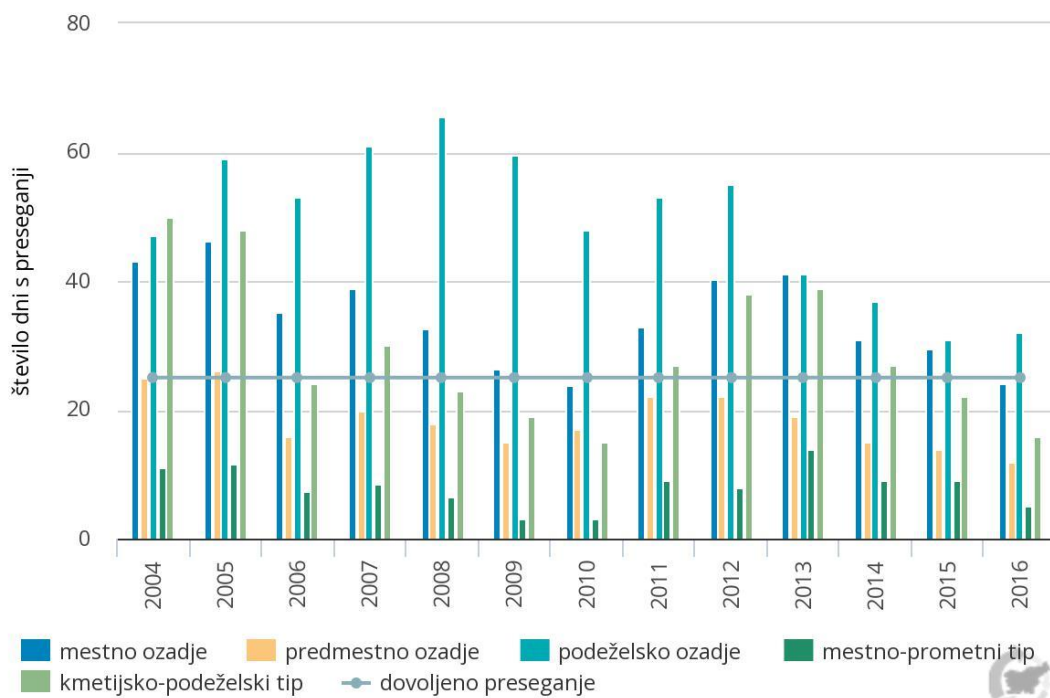


Figure 29: The number of days when the target ozone value was exceeded in various places in Slovenia (source: Data collection on automatic measurements of state-run network for air quality monitoring (DMKZ), Slovenian Environment Agency, 2018)

mestno ozadje	Urban area
predmestno ozadje	Suburban area
mestno-prometni tip	Urban-transportation type
kmetijsko-podeželski tip	Agricultural-rural type
industrijsko-podeželski tip	Industrial-rural type
podeželsko-naravno ozadje	Rural-natural area
dovoljeno preseganje	Permitted exceeded ceiling
število dni s preseganji	Number of days of exceeded values

4.4.3 NOISE POLLUTION

Noise pollution is a significant factor impacting the quality of life and an important environmental issue, since there is an ever increasing amount of information available on the harmful consequences of permanent exposure to increased noise levels for human health and wellbeing. Exposure to excessive noise can cause irritation, disturb sleep, impact school children's cognitive functions, trigger physiological responses to stress and trigger cardiovascular diseases in people who are chronically exposed to noise.

Burdening of the environment and residence with noise is a problem encountered and systematically tackled by all industrialised countries. The predominating sources of noise are the same in all developed countries: road and rail traffic, air traffic, industry and construction as well as various activities of people during their leisure time. Road and railway transportation burden the highest number of people due to their spread and constant presence. Noise issues caused by state-owned road and rail traffic are resolved on the strategical level considering the existing noise burden on the environment on the state level as a whole, and measures to resolve this are planned by considering the future condition due to adopted interstate and state policies in transportation regulations.

Resolving excessive environmental noise pollution in accordance with Directive 2002/49/EC and harmonised Slovenian regulations is, regardless of the noise source, conducted in the following stages:

- current situation analysis and the identification of most burdened areas (strategic noise mapping),
- drawing up, adopting and implementing action plans for protection against noise at state and local levels,
- monitoring the implementation and efficiency of the action plan.

The noise source manager is obliged to implement all of the aforementioned activities. In Slovenia, the competent authority for state roads and railways is the Ministry of Infrastructure; the competent body for interstate roads is DARS d.d., settlement areas are under the jurisdiction of the administrations of competent municipalities; the obligation of the Republic of Slovenia as EU Member State is to collect data for the entire country on strategic activities in this field and to report to the European Commission in accordance with the Directive requirements.

The current environment state has been summarised according to strategic noise mapping results in 2011 and 2012. Noise mapping has been implemented on the basis of input data that was harmonised at the European level and has appropriate content as well as on the basis of calculation methods. The strategic map areas are shown on the figure below, the basic data on considered areas and noise sources as well as their managers are presented in the table below.

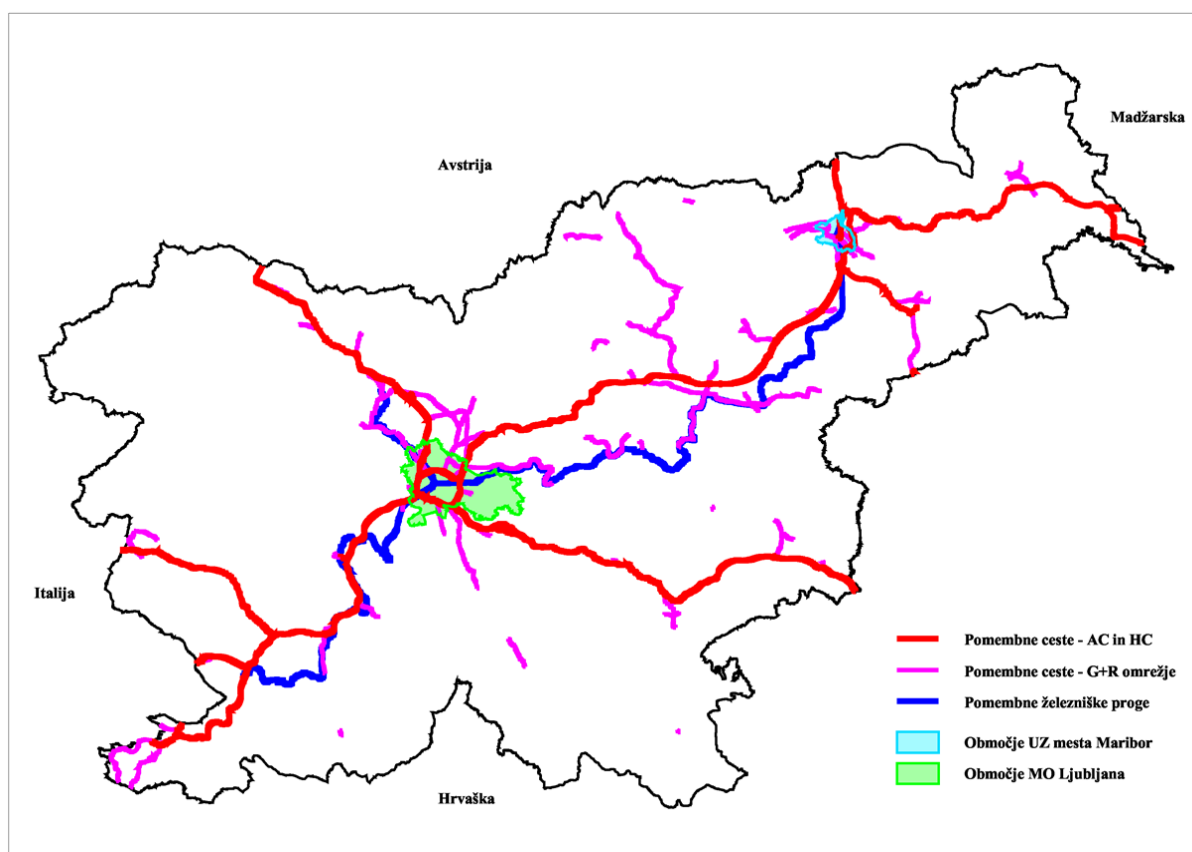


Figure 30: Strategic noise mapping areas in 2011, 2012 (Epi Spektrum d.o.o., 2016)

Pomembne ceste – AC in HC	Important roads – motorways and expressways
Pomembne ceste – G+R omrežje	Important roads – G+R network
Pomembne železniške proge	Important railway tracks
Območje UZ mesta Maribor	Maribor Area
Območje MO Ljubljana	Ljubljana city municipality area
Italija	Italy

Hrvaška	Croatia
Avstrija	Austria
Madžarska	Hungary

Table 7: Considered sections of roads, railways and considered settlement areas in the second phase of strategic noise mapping in Slovenia (Epi Spektrum d.o.o., 2016)

Source of noise	Manager	Year of consideration	Date of preparation	Area of consideration	Length, surface
Relevant roads	DARS d.d.	2011	May 2014	Entire motorway network	607kms
	MI – roads	2011	Dec. 2013	170 road sections	637kms
Relevant railways	MI – railways	2012	Jan. 2015	8 sections	289kms
Settlement areas	Municipality of Ljubljana	2012	Apr. 2014	Municipality	27,499 ha
	MO Maribor	2011	May 2014	UZ of Maribor	3,938 ha

All motorways and express roads at a total length of 607kms, relevant state roads sections at a total length of 637kms, relevant railway sections at a total length of 289kms and settlement areas of Municipality of Ljubljana and UZ area of Maribor have been considered. In the area of influence a total width of 1,500 metres on each side from all considered road and railway sections and along interstate roads, noise load was assessed at 118,510 buildings with protected premises, where 548,620 people were permanently residing, along state roads at 130,270 buildings (639,740 people), along railway lines at 63,140 buildings (409,700 people), and at 38,210 buildings (267,930 people) on the area of the Municipality of Ljubljana and at 12,920 buildings (90,240 people) on the area of the Municipality of Maribor. It was estimated that noise pollution was assessed for approximately 57 percent of all people in Slovenia.

According to the European Environmental Agency (EEA 2014) data, which considers the results of the second phase of strategic noise mapping until 2012, 125 million people are exposed in the area of the European Union to noise above 55 dB(A) caused by road traffic, 14 million people are exposed to noise due to rail traffic, 4 million due to air traffic and approximately one million people are exposed to noise due to industrial sources on settlement areas. In Slovenia, 195 thousand people are exposed to noise all day along relevant interstate and state roads and 45 thousand people are exposed along relevant railway lines.

The collected data on the number of overburdened people in Slovenia are shown in the table below. Data on exposure of people to noise have been derived from data on the burden of each individual building and on the number of people residing in each building and refers exclusively to people who have permanent residence. The number has been separately assessed for a) all relevant roads and railways in Slovenia regardless of their route and b) on both settlement areas for traffic routes with known traffic data, regardless of whether this involves relevant or local roads and for all railway lines. The actual total number of all overburdened people is thus smaller than the sum of people who are significantly exposed to noise for each noise indicator.

Dispersed buildings in the countryside and blocks of flats in large settlements are typical for the settlement pattern in Slovenia. The average number of residents in an individual building in the countryside is therefore significantly smaller than in settlements, resulting in the fact that there are too many people exposed to noise, especially in the area of large settlements, i.e. in areas with dense

blocks of flats directly at traffic routes. Data about residents who are exposed to noise within limits or critically, are presented below.

Table 8: The number of residents in Slovenia who are overly exposed to noise (in thousands)

Source of noise	Manager	Limit values				Critical values	
		L _{DAY}	L _{EVENING}	L _{NIGHT}	L _{DEN}	L _{NIGHT}	L _{DEN}
Roads	DARS d.d.	0.4	1.5	2.2	1.2	0.7	0.4
	MI – roads	39.9	59.4	57.6	52.1	28.4	21.2
Railways	MI – railways	3.6	15.2	29.7	18.7	16.4	10.6
Settlement areas	MOL – roads	34.8	66.6	36.5	42.2	10.2	13.7
	MOL – railways	1.3	8.3	16.0	8.6	8.1	4.7
	UZ MB – roads	14.3	27.2	25.2	22.4	7.4	4.9
	UZ MB - railways	0.0	0.1	0.7	0.3	0.2	0.0
	UZ MB – total	14.1	27.7	25.8	22.8	7.9	5.1

Data in the table shows that at all times of the day, the people who are most exposed to noise are those living in areas along state roads (more than 59,000 in the evenings) and their number is also high in both settlement areas (Ljubljana 66,000, Maribor 27,000), along relevant railways (30,000) and quite smaller along interstate roads (2,200). It should also be emphasised that the data refers to all motorways and traffic routes on settlement areas, while a large part of roads and railways with regard to state roads and main railway lines, not considered to be relevant, has not been considered, although the expected burden on the environment along those roads and routes is just as high.

The number of residents who are critically exposed to noise is far largest along state roads (28,400) and railways (16,400), the number of critically exposed residents to noise is also high on both settlement areas (Ljubljana 13,700, Maribor 7,900).

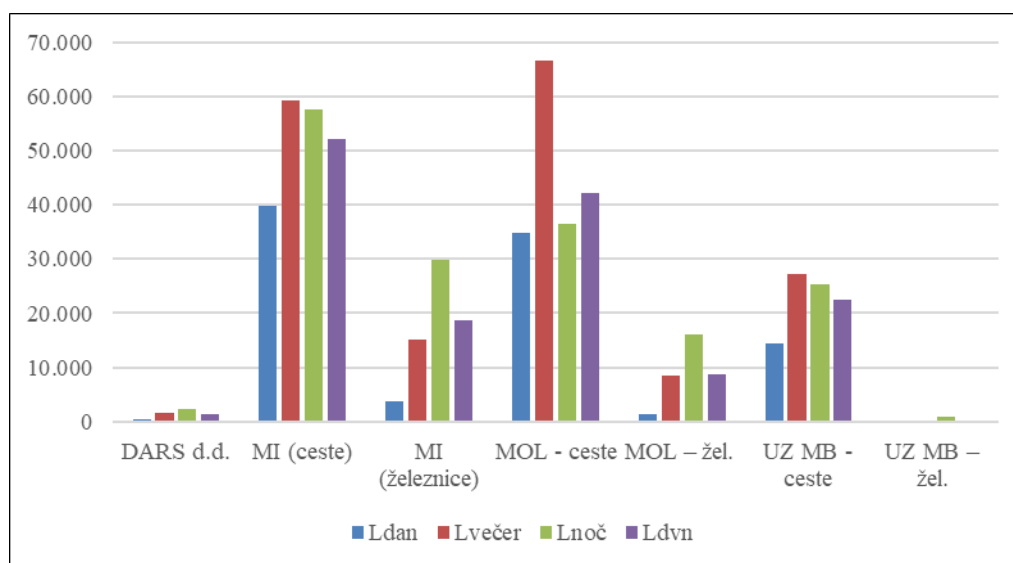


Figure 31: The number of residents in Slovenia who are overly exposed to noise – limit values

DARS d.d.	MI (roads)
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MI (ceste)	MI (roads)
MI (železnice)	MI (railways)
MOL - ceste	MOL – roads
MOL – žel.	MOL – rail.
UZ MB - ceste	UZ MB – roads
UZ MB – žel.	UZ MB – žel.
Ldan	Lday
Lvečer	Levening
Lnoč	Lnight
Ldvn	Lden

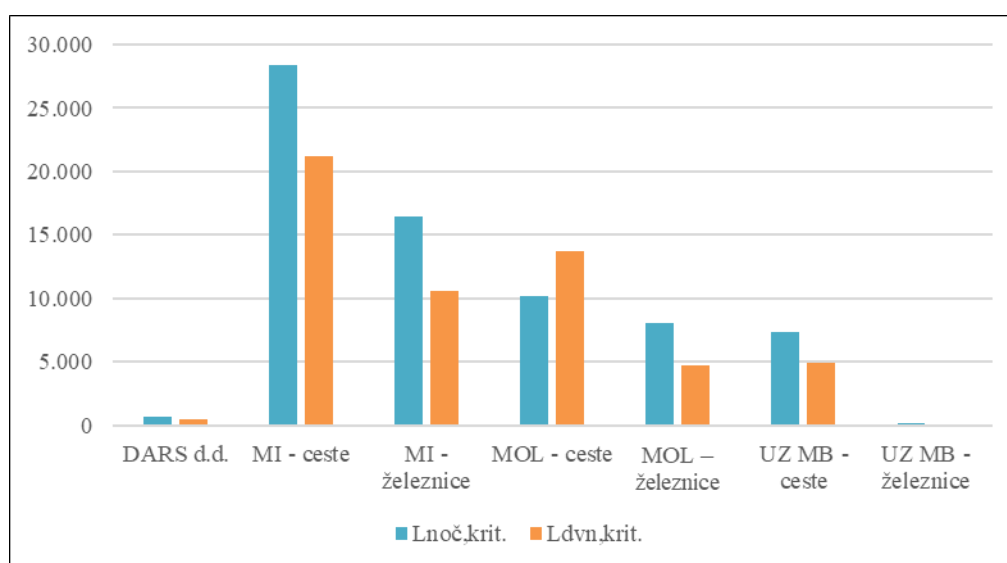


Figure 32: The number of residents in Slovenia who are overly exposed to noise – critical values

DARS d.d.	MI (roads)
MI (ceste)	MI (roads)
MI (železnice)	MI (railways)
MOL - ceste	MOL – roads
MOL – žel.	MOL – rail.
UZ MB - ceste	UZ MB – roads
UZ MB – žel.	UZ MB – žel.
Lnoč, krit.	Lnight, crit.
Ldvn, krit.	Lden, crit.

The measures in relation to protecting the environment against the current noise sources are connected with significant funds, whereas the basic guideline is the use of limited funds for implementing measures for reducing noise pollution and exposure of residents in areas that are overburdened with noise. It is also important that the same criteria are considered in the planning and implementation of those measures on the level of each individual relevant party and on the level of the entire country. A comprehensive noise reduction strategy at existing and envisaged traffic infrastructure in the European Union has been determined on the level of each individual Member State, although the approaches differ in various states. In Member States, where the strategy for the reduction of traffic noise reduction has been adopted as a legal obligation and appropriate executive regulations and guidelines have been adopted, the measures are fully underway.

4.4.4 ELECTROMAGNETIC RADIATION

In Slovenia, the control of electromagnetic fields of low frequency sources of EMR in the frequency range between 0 and 10 kHz, rated voltage above 1 kV, is governed by regulations. Operators of EMR sources must provide for the initial measurements after the start-up of a new or reconstructed source of radiation and periodic measurements every five calendar years for low-frequency radiation sources.

Measurements carried out by authorised institutions in Slovenia in the surroundings of low- and high-frequency electromagnetic radiation sources show that the loading of the natural and living environment with electromagnetic radiation does not exceed the limits imposed by the regulation on electromagnetic radiation in the natural and living environment (Official Gazette of the Republic of Slovenia [*Uradni list RS*], no. 70/1996 and 41/2004-ZVO-1). The results of measurements of the background loading of the environment in 2006 and the measurement campaign in Slovenian municipalities in the 2005–2008 period show that the typical loading of the natural and living environments with EMR in Slovenia is small, as the highest values measured 3 percent of the threshold value.

There has been established a data register of radiation load sources based on the initial measurements and operational monitoring of electromagnetic radiation in the natural and living environment carried out by authorised institutions for persons liable, or owners or operators of radiation sources in accordance with the regulations. Measurements carried out in the surrounding low- and high-frequency electromagnetic radiation sources indicate that the loading the natural and living environment with electromagnetic radiation does not exceed the limit values.

In 2006, background measurements of environment loading with high frequency EMR in the range of 80-3,000 MHz (broadcasting, mobile telephony...) were carried out in the cities of Ljubljana, Maribor, part of Koper and at five other locations in Slovenia. Measurements were carried out in selective frequency ranges across the bandwidths of the main sources in the environment (radio frequencies and television frequencies GSM2, DCS3 and UMTS4). The results show that the loading of the natural and living environment with EMR in almost all cases is small, as the maximum measured values reach only about 3 percent of the limit values. The measurement campaign now includes over 60 municipalities from different regions of Slovenia, on the basis of received applications at the Community and the Association of Municipalities of Slovenia. The measurement results of measurement campaigns in the period 2005-2008 show that the loading of the natural and living environment with electromagnetic radiation does not exceed the very strict limits. Average radiation loads have only rarely exceeded 1 percent of the permitted limit values.

The low values of radiation loading measured so far do not mean that they are low everywhere, as the intensity of the EMR in an environment is a highly dynamic phenomenon, affected by several factors, which changes according to both time and space. To determine the radiation loading in a given area, there is practically no other option other than carrying out EMR measurements.

In 2014, the Non-ionizing Radiation Institute conducted permanent magnetic field measurements near 220 and 400 kV overhead power lines. The purpose of the measurements was to establish the current radiation burden on the natural and living environment at six sites that were most frequently mentioned by the public as being problematic from the aspect of risk perception. The results of the conducted permanent measurements have shown that in cases where overhead lines are more than 60 metres from the site of permanent measurement, their effects are negligible and comparable or smaller than radiation burdens caused by household installations and other electricity consumers in buildings in their surroundings.

4.5 POPULATION AND MATERIAL ASSETS

Dispersed and rare settlements are typical for Slovenia. The population is dense in large urban centres, while areas with diverse relief and poorer natural and geographic conditions as well as areas where access for traffic is more difficult are less densely populated. The EUROPOP2015 population projection (middle variant) has shown that the number of people in Slovenia will increase until 2025, while from that year onwards it will decline. From the current population of 2.06 million people, the number will increase until 2025, i.e. to 2.08 million, then it will slowly decline and lower to 1.94 million by the year 2080 (source: Statistical Office of the Republic of Slovenia).

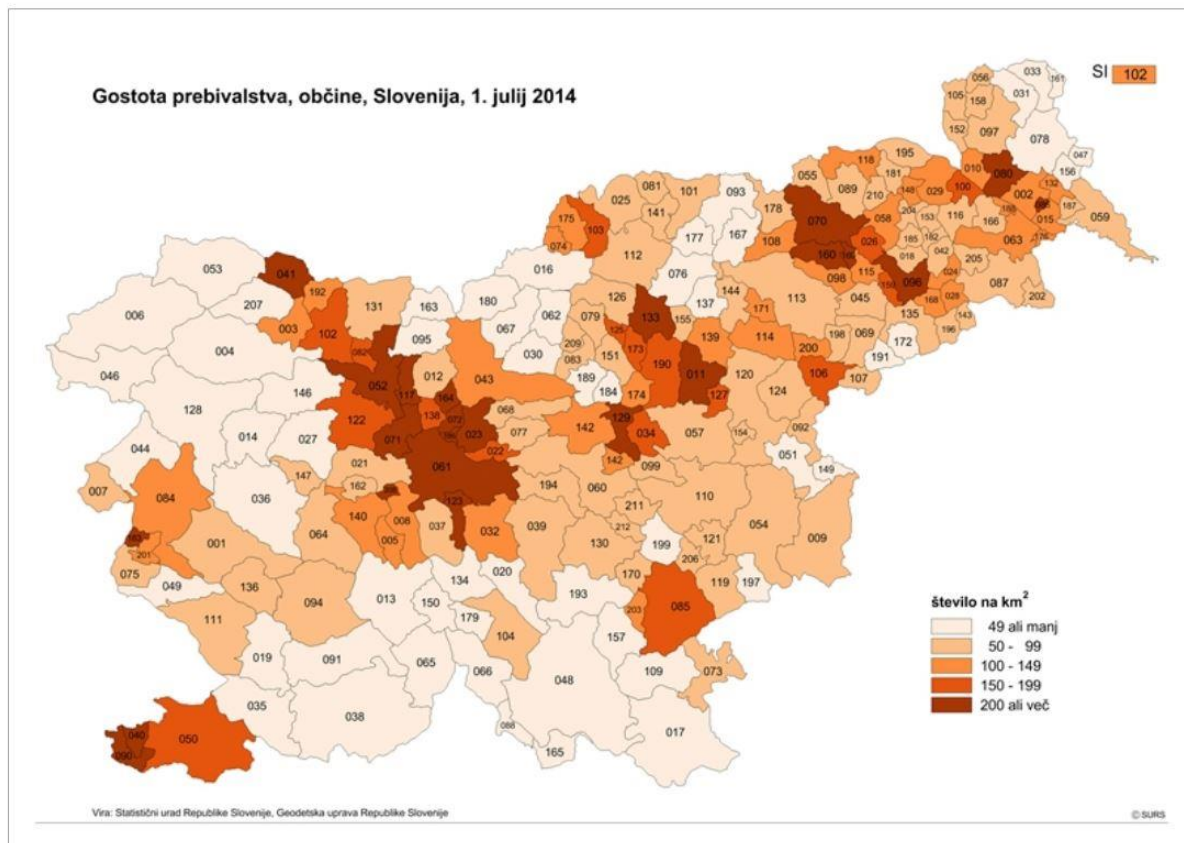


Figure 33: Population density by municipalities (Source: Statistical Office of the Republic of Slovenia)

Vir. Statistični urad Republike Slovenije, Geodetska uprava Republike Slovenije	Sources: Statistical Office of the Republic of Slovenia, Surveying and Mapping Authority of the Republic of Slovenia
število na km ²	number per km ²
49 ali manj	49 or less
200 ali več	200 or more
Gostota prebivalstva , občine, Slovenija, 1. Julij 2014	Population density, municipalities, Slovenia, 1 July 2014

In 2014, there was an average of 102 people per square kilometre. There are major differences in settlement among municipalities because in surface area and the number of people, municipalities differ greatly. The most densely populated municipality in 2014 was Ljubljana, followed by the municipalities of Maribor and Izola. The least densely populated municipality was Solčava with barely 5 people per square kilometre. The least densely populated region among statistical regions was the

Primorska and Notranjska region, where there was an average of 36 people per square kilometre (source: Statistical Office of the Republic of Slovenia).

Social welfare in Slovenia is constantly improving. The human development level is high where men and women have almost equal access to health, income and education, although the gender distribution of social power is still unequal. The Slovenian economy is gradually nearing the average level of development of the European Union, despite the slower GDP growth from 2008 to 2016. The drop in added value was most significant in processing activities, construction and trade. The deterioration of the situation in the labour market also affects the drop in private consumption (source: ARSO, 2016), although due to the economic growth in 2017 the situation is significantly improving. The current unemployment rate (2019) is 4.8 percent (source: Statistical Office of the Republic of Slovenia).

Tourism

After the drop in the number of tourists and tourist capacities in Slovenia due to the war for independence, tourism has been increasing since 1992 with regard to the number of available beds for tourists, especially with regard to the number of tourist overnight stays in Slovenia. In 2009, there were 91,332 tourist beds available and there were 8,302,231 overnight stays, meaning that the beds were occupied for one fourth of the year on average (91 nights). Compared to 2008, the number of beds has increased and the number of overnight stays slightly dropped due to the economic crisis.

The share of foreign tourists is constantly increasing. The ratio between domestic and foreign guests has changed after 2000 in favour of foreign guests. The share of overnight stays of foreign guests increased from 40 percent in 1992 to 58 percent in 2008.

Seasonal variability of tourism is quite significant, since the number of overnight stays of all tourists in August as the most visited month of the year is almost four times higher than in November, the month featuring the least overnight stays. The number of tourists is concentrated in the summer season that lasts approximately three months, from mid-June to mid-September. The majority of tourists in this period stay in coastal areas (slightly less than one third of all tourist overnight stays), slightly fewer stay in mountain and health resort areas, while the most guests in the winter stay in health and mountain resorts.

The number of beds, especially the number of overnight stays, increased in the considered period (1992–2009). The most overnight stays are recorded in the summer months, when most tourists stay in coastal areas, while fewer stay in mountain and health resorts. In the winter months, most overnight stays are recorded in health resorts (source: ARSO, 2016).

4.6 CULTURAL HERITAGE

The integrated conservation of the heritage shall be realised through development planning and measures of the state, regions and municipalities, so that they include the heritage with due regard to its special nature and social interest in sustainable development. In July (as on 5 July 2019), the Cultural Heritage Register at the Ministry of Culture included 32,449 units of heritage. The number of registered units of cultural heritage has been increasing recently, particularly the number of registered archaeological sites.

Three monuments (Plečnik's Žale, Franja Partisan Hospital, Memorial Church of the Holy Spirit in Javorca) bear a European Heritage Label, and another two (pre-historic pile dwellings in Ig and the Ljubljana Marshes, mercury mining tradition in Idrija) are on the UNESCO World Heritage list in the cultural heritage category.

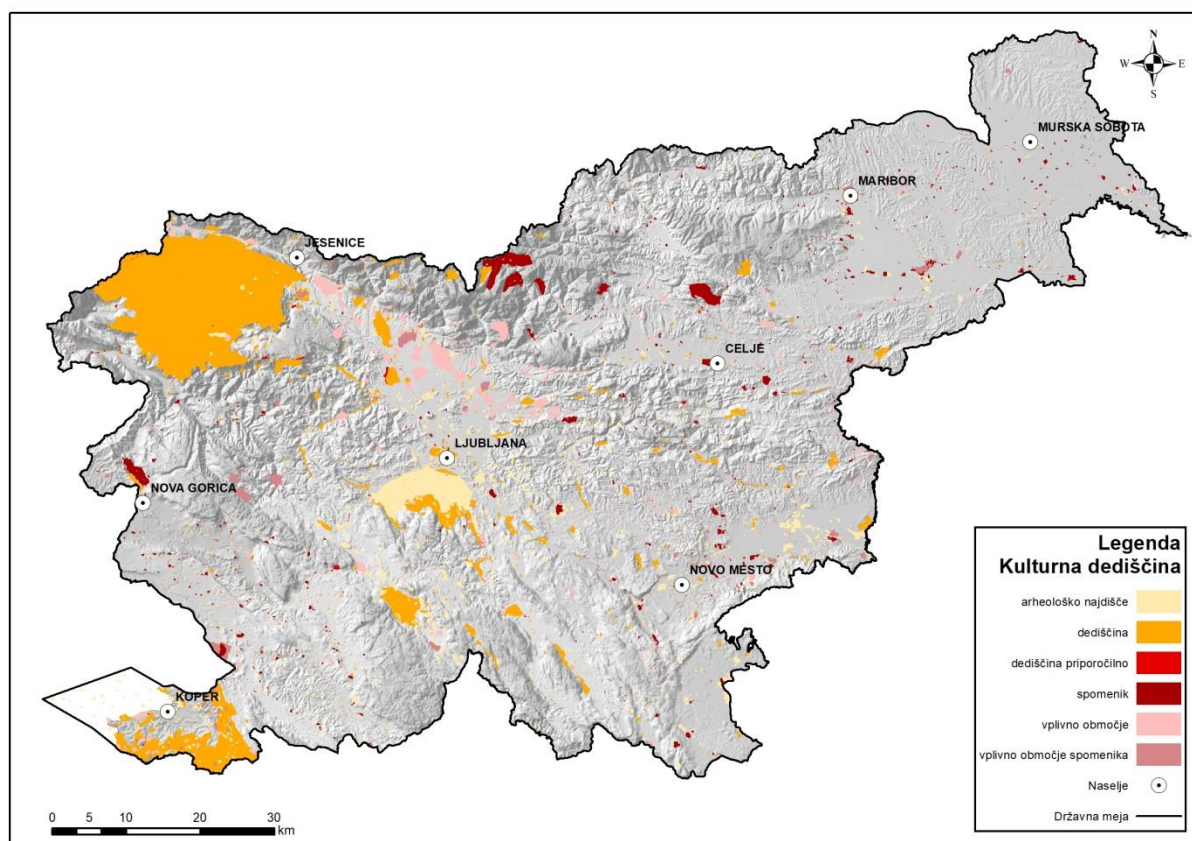


Figure 34: Cultural heritage units with regard to the cultural heritage protection regime in Slovenia
 (source: Register of Immovable Cultural Heritage (eVRD), MK (on 5 July 2019))

Legenda	Key
Kulturna dediščina	Cultural heritage
Arheološko najdišče	Archaeological site
Dediščina	Heritage
Dediščina priporočilno	Heritage recommended
Spomenik	Monument
Vplivno območje	Impact area
Vplivno območje spomenika	Monument's impact area
Naselje	Settlement
Državna meja	State border

The situation in cultural heritage is cause for concern, since more than 830 cultural heritage units have been lost since 2002, of which most units belong to profane building heritage (668 units or 5 percent of all profane building heritage, 24 units or 3 percent of urban heritage and a total of 18 units or 1 percent of sacral-profane and sacral heritage). This situation has been impacted by natural events (earthquakes, fires, floods), wars, construction (infrastructure and other), regulations and other interventions in space as well as the lack of maintenance or destruction (source: Ministry of Culture, 2018). Heritage endangerment by individual types of heritage is presented in continuation and summarised according to the Immovable cultural heritage situation assessment in Slovenia 2011 (ZVKDS).

Archaeological heritage

In general, the situation of archaeological heritage is poor. Archaeological remains in urban and urbanising settlements are mostly endangered due to frequent activities underground (construction of

parking houses, new buildings, reconstruction of buildings, infrastructure building). This especially applies to settlements with major interests in construction (the coastal area, tourist places in the interior) and for cities with a high density of exceptionally valuable archaeological heritage (Ljubljana, Ptuj, Celje, Kranj, Koper, Ajdovščina), where archaeological remains are in the process of building new infrastructural facilities rescued merely on the basis of preliminary research. Archaeological heritage in forests is at least endangered, because it is mostly preserved “in situ”. It is endangered by the building of skidding trails, forestation, surface filling and depositing waste material. Archaeological sites on agricultural land are endangered by normal agricultural activities such as deep ploughing, mulching, hydro-melioration, land consolidation, surface filling and recently, the usage of aggressive fertilisers and protective substances. Archaeological heritage on premium agricultural land is usually not endangered due to construction, except for planned infrastructural interventions. The situation on other agricultural land is different, especially if municipalities are inclined to changing their intended use. In most cases, excavations are the result of such changes and subsequently interventions, which causes the final destruction of an archaeological site. In open space, archaeological heritage is substantially endangered through the expansion of settlements and the construction of major infrastructural lines (construction and restoration of sewage system and gas pipeline networks), especially where the construction is not implemented in accordance with the preventive archaeology principles.

Architectural heritage

The entire situation of architectural heritage, regardless of the location or type, depends on the awareness and the financial condition of its owners. Inappropriate and insufficient maintenance of preserved structures that are endangered by earthquakes and weather events such as floods or hurricanes present a major problem for preserving architectural heritage. Rural architectural heritage is the most endangered type of architectural heritage (residential houses or homesteads, commercial buildings such as stalls, granaries, drying rooms, hayracks, fruit drying facilities, mills, saws etc.). This is mostly the result of a different way of living (demands for a higher living standard) and agricultural production where agriculture has not been entirely abandoned (stricter sanitary regulations, use of modern mechanisation, fertilisers and protective substances, etc.). Challenging accessibility to some facilities and the complexity of maintenance and restoration also lead to poor preservation of the architectural heritage in the countryside. Homesteads or individual buildings that are not inhabited and are poorly maintained are especially endangered. The extent of removal of architectural heritage buildings is also increasing and the environment is also becoming degraded through non permitted interventions and less complex buildings, especially in areas of the cultural landscape. Older rural churches are in an especially critical situation, castles without any clear owners who do not have the funds to maintain, restore or revitalise them, are also dilapidating. Compared to architectural heritage in the countryside, the situation of urban architectural heritage in cities and other large settlements is less troubling. Industrial architectural heritage is critically endangered because it mostly refers to demolition plans and new buildings or to dilapidation. Memorial heritage is also endangered due to changes in the socio-political system and related changes in the ownership of land (where monuments are located) or is subjected to rapid dilapidation due to exposure to atmospheric impacts and poor material, humidity and frost as well as due to the lack of basic maintenance. Sacral heritage is the most regularly maintained, therefore, its material condition is generally quite good, although the restoration of sacral facility equipment remains problematic (paintings, frescoes, wooden and stone altars, etc.). Roadside shrines are poorly or unprofessionally maintained which, from the aspect of preserving authentic sites as one of the important elements of their protection, are not endangered. Garden architectural heritage is in a worse condition because it is not given sufficient attention. Many parks and gardens are neither maintained nor managed as elements of cultural heritage, only the dilapidation condition is documented.

Cultural landscape, settlement heritage

The cultural landscape is among the least recognised part of cultural heritage and is often under the influence of inappropriate interventions. On one hand it is mostly endangered through urbanisation

and the construction of intermediary zones between the city and the countryside, which do not consider localities of the use of space and construction, on the other hand it is endangered because of the decrease in population dealing with agriculture, due to the abandonment of traditional farm use, abandonment of terraces, hedges, dry stone walls, typical auxiliary buildings (stone houses or hayracks) and other forms of landscape degradation, including the modification of water volume and groundwater height, erosion, sink holes, landslides and similar. Besides expanding settlement areas, tourism development is a special aspect of cultural landscape endangerment, which does not consider the principles of sustainability or is not based on preserving natural assets and cultural heritage. The areas of settlement heritage, where investors want to remove facilities and build new ones, are also endangered. Settlement heritage is endangered by numerous uncontrolled interventions such as building various facilities in gardens, building garages and other non-complex or simple buildings, causing a gradual loss of a proper relationship between the built and non-built areas as well as the loss of essential typological and morphological features of areas. Settlement heritage is also degraded with inappropriate adaptations and reconstructions of building fabric. Traditional settlement bases are disappearing due to new buildings outside of central areas, land plotting does not follow the traditional pattern of distributing individual building units as a whole, integrating buildings in streets or similar groups does not emerge from the traditional scheme of expansion. Despite this, a large part of the settlement centres have preserved the primary image and most of them are recorded as areas of settlement heritage.

4.7 LANDSCAPE

Landscapes in Slovenia are very diverse in terms of morphological features, which is the result of natural conditions and human influences, especially variegated geomorphology and various climate zones, the use of space, historical development and the variety of cultural milieus. Thus landscapes in Slovenia show great diversity and richness of landscape patterns. There are five basic landscape areas in Slovenia that are mostly defined by the climate: alpine landscapes, pre-Alpine landscapes, Pannonian region landscapes, Karst region landscapes of the interior Slovenia and the coastal area.



Figure 35: Landscape regions in Slovenia (Regional distribution of landscape types in Slovenia, source: <http://www.krajinskapolitika.si/>)

Alpske krajine	Alpine landscapes
Predalpske krajine	Sub-Alpine landscapes
Subpanonske krajine	Sub-Pannonian landscapes
Kraške krajine notranje Slovenije	Landscapes of the karstic world of inland Slovenia
Primorske krajine	Littoral landscapes

Exceptional landscapes and landscape areas with distinctive features at the national level have a special status. There are 93 areas of exceptional landscape and 60 landscape areas with distinctive features defined in Slovenia and are determined by the Spatial Planning Strategy of Slovenia. Landscape areas with distinctive features at the national level are areas that include recognisable and representative parts of the Slovenian landscape, with well-preserved landscape elements; in particular, these are areas of outstanding landscape with rare or unique patterns of landscape structure and a spatially underlined cultural heritage of high testimonial and memorial value, in combination with exceptional forms of natural elements and with valuable natural features.

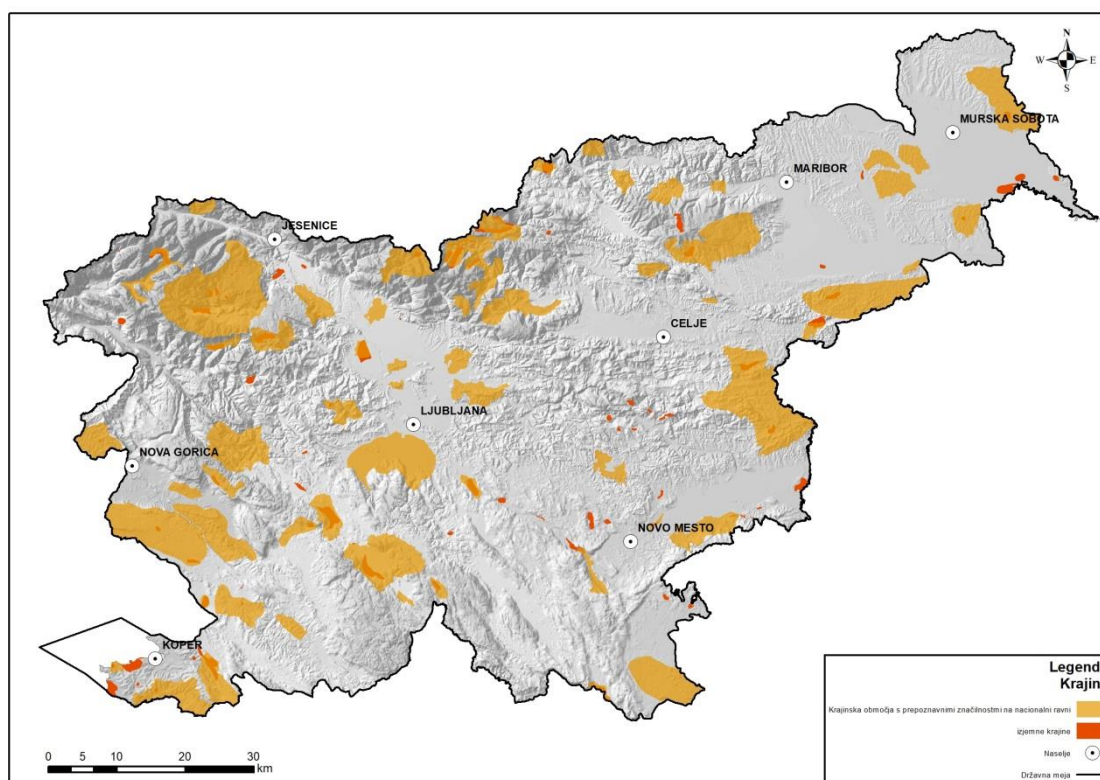


Figure 36: Areas of exceptional landscapes and landscape areas with distinctive features (Source: MOP)

Legenda	Key
Krajina	Landscape
Krajinska območja s prepoznavnimi značilnostmi na nacionalni ravni	Landscape areas with distinctive features on the national level
Izjemne krajine	Exceptional landscapes
Naselja	Settlements
Državna meja	State border

The state of Slovenian landscapes is characterised in certain areas by diversity, a high level of preservation of natural resources and preservation of cultural elements of the landscape, many cases of degradation are also noticeable in other areas. Accelerated development has progressed in the past few decades; the enhanced development of technologies, intensification of agriculture, depopulation of

individual agricultural areas, the development of tourism and other processes have further impacted spatial development. These impacts are reflected in the loss of spatial features, increased uniformity and in the reduction of natural and cultural features, quite often also in lost ecological balance. The most noticeable activity leading to the modification of the functional and morphological image of Slovenian landscape is agriculture, mostly due to polarisation that is characterised by the increase in differences between landscapes, where processing technologies incline to greater productivity and landscapes where production is abandoned especially due to introduced modern technological procedures and unfavourable natural conditions. Extensification of agriculture also leads to greening, forestation, depopulation and the dilapidation of architectural heritage. On flat areas, agriculture is intensified with agro-melioration, hydro-melioration and the specialisation of agricultural activity. The landscape structure is becoming illegible and dispersed into several mutually functionally independent parts also due to the integration of infrastructural facilities (motorways, gas pipelines, overhead lines, railway corridors) (Kante, 2018). One of the key activities that are changing the image of Slovenian landscapes is settlement or dispersed building (around large cities and in the countryside) and the grouping of buildings along the motorway network and regional centres. In previous periods, the trend of settlement of non-rural population in the countryside has also been noticeable; rural settlements are consequently expanding outside former village centres, new architectural elements are emerging, thus the traditional countryside image of a settlement is disappearing. Similar changes are also brought in the space by tourism, because the construction of tourist infrastructure and the abandonment of agricultural activity are causing the loss of diversity of former countryside areas. Many forms of degradation are noticeable in other areas, such as non-restored or poorly arranged quarries, gravel pits and clay pits, overly regulated watercourses, inadequate construction activities in the form of large cuts and embankments and inadequate levelling of terrain. Illegal interventions in the spatial area are also quite common and they often led to additional degradation of landscape areas.

The scope and features of changes of exceptional landscapes in the past twenty years as well as finding connections with the methods of their management and introduction of best practices of management and handling of exceptional landscapes in Slovenia as well as with the absence of comprehensive monitoring is highlighted in the master's thesis entitled "Changes to Slovenian exceptional landscapes in relation to the way they are managed" (Kante, 2018). Key findings from this thesis are presented in continuation. Work on the basis of criteria determined in the research study of the Landscape Architecture Institute of the Faculty of Biology and the Spatial Planning Office, entitled "Landscape Protection Strategy in Slovenia" (Ogrin et al., 1996) has determined indicators to record changes that have emerged in exceptional landscapes over the past twenty years. The current situation was established on the basis of 40 pilot cases of exceptional landscapes (chosen with regard to representation of all five landscape macro regions and the presence/absence of protected areas), field visits and photo interpretations of DOF images, the previous condition of the mentioned areas was established on the basis of photo interpretations of DOF images from previous years. The research did not discuss all areas on the list of exceptional landscapes and all typological groups as well as all five landscape regions were included to ensure that all important and defining features of landscape structure of Slovenia were represented. Quality research was founded on subjective data that is more difficult to measure, whereas the recorded changes were interpreted with the distribution in three categories that revealed the situation of exceptional landscapes, i.e.: (1) the recorded changes had a positive effect on features determining landscape as exceptional, (2) there were no recorded changes/changes were recorded but did not significantly impact features that determine landscape as exceptional, (3) changes were recorded and significantly (negatively) impacted the features that determine the landscape as exceptional. All considered landscapes were ranked in (2) category because changes were noticed in all exceptional landscapes, although they did not significantly impact the features that determine the landscape as exceptional. Besides quality analysis, the research also focused on the quantitative analysis of changes in actual use of considered areas (from 2002 to 2017) and an analysis of changes, evident from digital ortho-photo images (since 1994), on the basis of which the trends of changes of exceptional landscapes were found. The chosen areas of exceptional landscapes were within the quantitative research categorised in two main categories with regard to the prevailing process of recorded changes of the actual use of land. Exceptional landscape areas were categorised on the basis of which category of the actual use of land and recorded changes takes a

larger share, thus it was subsequently discovered whether the trend of modification of exceptional landscapes leads to the process of extensification or intensification. The intensification process includes the increase in intensity of the processing of agricultural land (changing forest areas into processed areas, meadows into fields and increasing the contiguousness of field areas), expanding industrial, craft and service activities, the occurrence of new buildings outside of densely built-up areas, intensive suburbanisation and the introduction of new architectural elements. Extensification includes the reduction of the scope of agricultural production, greening and abandoning agricultural activity, leading to the overgrowing of processing areas (forestation) and physical dilapidation of settlements and traditional architectural heritage. The results of the research show that the majority of exceptional landscapes in Slovenia are subject to extensification (63 percent of exceptional landscapes), whereas the abandonment of agricultural land and increasing the share of forests are also noticeable. The intensification process was recorded in 19 percent of exceptional landscapes, minor changes referring to considered processes were recorded on 15 percent of exceptional landscapes, for 3 percent of exceptional landscapes data regarding recorded changes referring to considered processes were not accessible (Kante, 2018).

No mechanisms for monitoring the situation in the environment or records have been established for the purpose of maintaining and conserving landscape areas at the national level. These areas are conserved within the scope of nature conservation/protected areas, the promotion of rural development (agriculture)/subsidies or protection regimes, the conservation of cultural heritage/landscape cultural heritage and within the scope of water management/limitations on activities in riparian areas.

5. STARTING POINTS FOR DRAFTING THE ENVIRONMENTAL REPORT

5.1 IDENTIFICATION OF ENVIRONMENTAL OBJECTIVES

Environmental objectives for the SDSS have been determined on the basis of the analysis of:

- potential environmental impacts caused by the implementation of key measures to achieve the SDSS objectives (section 3.5),
- the current environment condition (section 4) and
- the assumed commitments specified in ratified treaties and regulations of the European Union and strategic documents of the Republic of Slovenia and legislative acts (section 5.2.3).

5.1.1 IDENTIFICATION OF ENVIRONMENTAL IMPACTS THAT COULD BE CAUSED BY IMPLEMENTATION

Table 9 shows the overview of potential environmental impacts caused by the implementation of individual measures to achieve the SDSS objectives. The right column shows whether any impact will be noticed in an individual area that should be comprehensively assessed.

Table 13: Review of important impacts of the SDSS 2050 on the environment

Environment area	Definition of potential impacts	Assessment of the area YES/NO
Natural resources: land and forest	<ul style="list-style-type: none"> - Spatial development impacts the degradation of land and reduces the preservation and resilience of forests. - Spatial development is not possible without permanent changing the land use. The areas of forest and agricultural land are also decreasing due to the expansion of urban areas. Appropriate spatial development can significantly contribute to reducing the degradation of land. - Positive impact on the preservation of a good land condition and forests due to planned sustainable use of natural resources (focus on reuse, sustainable and innovative use and quality use of local resources, better utilisation of infrastructure etc.). - Positive impact due to the introduction of green infrastructure and rationalisation of distribution of activities in the environment. 	YES
Air	<ul style="list-style-type: none"> - Spatial development influences the reduction of emissions of air pollutants. - Positive impact due to the preparation of a policy and the implementation of measures to improve the air quality in urban environments. - Planned development of the traffic infrastructure, support to hub development for intermodality and comodality in functional urban areas, development of logistics centres and connections with commercial centres in functional urban areas can cause the reduction of emissions of air pollutants. 	YES

	<p>ELECTROMAGNETIC RADIATION (EMR)</p> <ul style="list-style-type: none"> - Considering the prescribed EMR standards principally ensures the use of potential EMR sources that is still acceptable for human health. - negative effects are possible due to planning electric power facilities (overhead power lines, transformer stations, base stations, etc.). <p>LIGHT POLLUTION</p> <ul style="list-style-type: none"> - Considering prescribed standards on light pollution ensures an acceptable level of light pollution. - The envisaged limitation of illumination of space at night in settlements presents a positive impact. <p>DRINKING WATER</p> <ul style="list-style-type: none"> - Negative impact on the suitability and volume of drinking water in the case of inappropriate spatial development in water protection areas is possible. <p>VIBRATIONS</p> <ul style="list-style-type: none"> - Have an important impact on the selection of exact locations of individual facilities, although they cannot be identified in the phase of a comprehensive environmental impact assessment. 	<p>YES</p> <p>YES</p> <p>YES</p> <p>NO</p>
Population and material assets	<ul style="list-style-type: none"> - Population and infrastructure systems as well as intensive methods of natural resources management have a significant effect on the quality of the living environment. - SDSS emphasises greater collaboration and cooperation for resolving specific spatial and development problems, which has a positive impact on the population and material assets. - The envisaged promotion of Slovenia as green, active, healthy, the support to local development and tourist development of cities can positively impact the welfare of the population. - The impact on the quality of life due to shorter supply/production chains and consequently decreased need for multiple-day mobility has been recognised (saving time, lower exposure to traffic accidents, etc.). - Spatial development can increase the pressure on population and material assets due to flood risk. Hydro-morphological load on water caused by the pressure of construction on water and waterside land as well as flood areas can impact the category of flood risk on an individual area. Appropriate spatial development can significantly contribute to reducing hydro-morphological load on waters and to reducing flood risk. 	<p>YES</p>
Cultural heritage	<ul style="list-style-type: none"> - Spatial development increases the pressure on cultural heritage units. By considering the current legislation, impacts will remain within the legally determined limits. - Permanent positive impact is expected due to the concern for the preservation of identifiable cultural environment elements, the restoration of cultural heritage and its integration in the life of a community. 	<p>YES</p>
Landscape	<ul style="list-style-type: none"> - Spatial development can impact landscape and visible features of space. - The positive impact of SDSS from the aspect of concern for quality architecture of buildings and public infrastructure as well as the image of cities and countryside settlements, the concern for creating spatial order, the preservation of spatial heritage and harmonic image of landscape. - By integrating new activities in space we change visible and landscape features of space. By considering the existing 	<p>YES</p>

	landscape patterns, exceptional landscapes and landscape areas with identifiable features, the impact will not be substantially negative.	
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Cross-border impacts

Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment demands that Member States define and consult on the cross-border effects of making plans and drafting programmes (i.e. those which may influence other Member States).

5.2 ENVIRONMENTAL OBJECTIVES AND INDICATORS

To define important environmental objectives, the assumed commitments specified in ratified treaties or regulations of the European Union, and in national strategic documents and legislative acts have been used. The connection between environmental areas and environmental objectives, and environmental plans, programmes and policies is shown in Table 12.

5.2.1 ENVIRONMENTAL OBJECTIVE I

Table 10: Environmental objectives for SDSS 2050

Important environmental objectives:	
Environmental objective 1	Ensure sustainable management of soil and forests
Environmental objective 2	Ensure the realisation of long-term goals for annual air pollutant emission amounts
Environmental objective 3	Prevent deterioration of the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters
Environmental objective 4	Preserve or ensure a good quantitative and chemical status of groundwater
Environmental objective 5	Ensure a good status of the marine environment
Environmental objective 6	Protect and preserve biodiversity
Environmental objective 7	Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected
Environmental objective 8	Reduce greenhouse gas emissions
Environmental objective 9	Reduce the vulnerability of infrastructure and settlements to climate change
Environmental objective 10	Provide people with a safe supply of wholesome drinking water in sufficient quantities
Environmental objective 11	Reduce the exposure of people to polluted air
Environmental objective 12	Reduce the exposure of people to excessive noise levels

Environmental objective 13	Prevent adverse effects on human health from the perspective of electromagnetic radiation and light pollution
Environmental objective 14	Ensure optimum distribution of activities in space
Environmental objective 15	Ensure a good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk
Environmental objective 16	Ensure comprehensive cultural heritage preservation
Environmental objective 17	Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a quality landscape image ³¹

5.2.2 INDICATOR I

The indicators in the table below (11) were defined on the basis of the selected environmental objectives. Indicators that are measurable and whose state is already being monitored in Slovenia are proposed as priorities. These are indicators, the results of which are systematically collected, processed and reported at the state level. When selecting indicators, indicators were used that are already being used to measure the state of the environment in Slovenia as part of the EIONET-SI network, which was established due to Slovenia's obligation to report to the European Environment Agency. The Environmental Indicators in Slovenia website provides access to over 180 indicators, which, with the help of graphs and comments, show the direction of environmental development in Slovenia.

Table 11: Environmental objectives and indicators for SDSS 2050

Environment area	Important environmental objectives SDSS	Indicators for assessment	Availability of indicators
1. Natural resources: land and forest	Environmental objective 1: Ensure the sustainable management of soil and forests	Surface area and the proportion of artificial land area, separately for developed and undeveloped artificial land	Indicators of the land use and land cover survey (LUCAS ³²) in the European Union

³¹The landscape image (or image) refers to an individual landscape unit determined within the Regional classification of landscape types in Slovenia (Marušič, I. 1998. Regionalna razdelitev krajinskih tipov v Sloveniji/Regional classification of landscape types. Ljubljana, Ministry of the Environment and Spatial Planning of the Republic of Slovenia, Spatial Planning Office of the Republic of Slovenia). The landscape image of units is defined by landscape patterns that are simultaneously the main holders of the landscape character. The landscape units were classified within the Regional classification of landscape types in Slovenia on the basis of nature preservation, diversity, spatial order and harmony, while the criteria of symbolic importance of natural and cultural elements were also added. As per the evaluation, the assessment of the status of landscape units was determined, which serves as the basis for monitoring the devaluation of the landscape image. Based on the results of the target research project and the upgrade of the Regional classification of landscape types in Slovenia, the criteria for high-quality landscape image will be defined.

³² Data on the land use and land cover from statistical research LUCAS are used to monitor the expansion of urban areas and the productivity of artificial land (considering GDP).

Environment area	Important environmental objectives SDSS	Indicators for assessment	Availability of indicators
		Surface area and the proportion of forest land	Indicators of the land use and land cover survey (LUCAS) in the European Union
		Reworking construction waste and demolition waste	Waste management [OD07]
2. Air	Environmental objective 2: Ensure the realisation of long-term goals for annual air pollutant emission amounts	Annual air pollutant emission amount	Projections of air pollutant emissions [ZR14] Emissions of substances that cause acidification and eutrophication [ZR09] Emissions of ozone precursors [ZR10] Emissions of particulates into the air [ZR15]
3. Water (surface and ground waters)	Environmental objective 3: Prevent deterioration of the status of surface waters and ensure the attainment of a good ecological status/potential and a good chemical status of surface waters Environmental objective 4: Preserve or ensure a good quantitative and chemical status of groundwater Environmental objective 5: Ensure a good status of the marine environment	Ecological and chemical status of surface waters Chemical and quantitative status of groundwater Status of marine environment	Chemical and ecological status of surface water [VD12] Groundwater quality [VD11] Status of marine environment by individual descriptors of marine environment status
4. Nature (biodiversity, nature conservation areas)	Environmental objective 6: Protect and preserve biodiversity	Preservation state of protected and endangered plant and animal species	Change of the conservation status of species and habitat types from the report as per Article 17 of the Habitats Directive (92/43/EEC). Change of the conservation status of species in the SPA areas and on the territory of the whole of Slovenia from the report as per Article 12 of the Directive on the

Environment area	Important environmental objectives SDSS	Indicators for assessment	Availability of indicators
			conservation of wild birds (79/409/EEC).
	Environmental objective 7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected.	Fragmentation of areas with nature conservation status	Spatial data (digital layer) for areas with a nature protection status are publicly accessible on ARSO website.
5. Climate factors	Environmental objective 8: Reduce GHG emissions Environmental objective 9: Reduce the vulnerability of infrastructure and settlements to climate change	Annual quantity of greenhouse gas emissions Infrastructure and settlements on flood areas	Greenhouse gas emissions [PS03] Areas of important impacts of floods, warning flood map (ARSO Geoportal)
6. Human health (drinking water, air quality, noise, EMR, light pollution)	Environmental objective 10: Provide people with a safe supply of wholesome drinking water in sufficient quantities	The number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Waters Act.	Water protection areas (ARSO Geoportal)
	Environmental objective 11: Reduce the exposure of people to polluted air	Excessive pollution of ambient air	Air quality [ZR11] Air pollution by PM ₁₀ and PM _{2.5} particulate matter [ZR08] Air pollution by ozone [ZR07]
	Environmental objective 12: Reduce the exposure of people to excessive noise levels	Exposure of population to noise due to SDSS implementation (the prevailing impact on noise pollution is mostly the result of road and railway traffic)	The number of residents in dense settlements in Slovenia who are overly exposed to noise Exposure of people to excessive noise based on noise mapping results

Environment area	Important environmental objectives SDSS	Indicators for assessment	Availability of indicators
	Environmental objective 13: Prevent adverse effects on human health from the perspective of EMR and light pollution	Surface of land plots under high voltage overhead lines	Surface of land plots under high voltage overhead lines
7. Population and material assets	<p>Environmental objective 14: Ensure optimum distribution of activities in space</p> <p>Environmental objective 15: Ensure a good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk</p>	<p>Social welfare (access to health, income and education)</p> <p>Development of economy and tourism</p> <p>Flood risk assessment</p>	<p>Human development index [SE03]</p> <p>Development and distribution of tourism [TU01]</p> <p>Gross domestic product [SE01]</p> <p>Flood risk areas surfaces</p>
8. Cultural heritage	Environmental objective 16: Ensure comprehensive cultural heritage preservation	Impact on features and integrity of cultural heritage	Inclusion of comprehensive preservation of cultural heritage in objectives, spatial development concept and guidelines for achieving the objectives and concept implementation
9. Landscape	Environmental objective 17: Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a quality landscape image	Impact on features and integrity of extraordinary landscapes and landscape areas with distinctive features at the national level	<p>Presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such</p> <p>Actual use in areas of exceptional landscape and landscape with distinctive features</p>

5.2.3 ASSUMED COMMITMENTS SPECIFIED IN RATIFIED TREATIES AND REGULATIONS OF THE EUROPEAN UNION, AND STRATEGIC DOCUMENTS OF THE REPUBLIC OF SLOVENIA AND LEGISLATIVE ACTS

The table presents important environmental policies, programmes, plans and legislative acts as well as their purpose and objective. The last two columns present the connection with relevant environment areas and environmental objectives.

Table 12: environmental policies, programmes, plans and legislative acts that were the basis for determining environmental objectives of SDSS 2050

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
European document	The 7th General Union Environment Action Programme to 2020 "Living well, within the limits of our planet, November 2013"	The 7th Environment Action Programme of the Union to 2020 provides a general framework for environment policy by 2020 and defines nine priority objectives which must be attained by Member States, i.e.: 1. to protect, conserve and enhance the Union's natural capital; 2. to transform the Union into a resource-efficient, green and competitive low-carbon economy; 3. to safeguard the Union's citizens from environment-related pressures and risks to health and well-being; 4. to maximise the benefits of Union environment legislation; 5. to improve the knowledge and evidence base for the Union environment policy; 6. to secure investment for the environment and climate policy and address environmental externalities; 7. to improve environmental integration and policy coherence; 8. to enhance the sustainability of the Union's cities; 9. to increase the Union's effectiveness in addressing international environmental and climate-related challenges.	Natural resources Air Climate factors Water Nature Human health	1,2,3,4,6,7,8,9,10,11,12,13
National document	Resolution on National Environmental Action Plan 2005–2012 (ReNPVO)	The ReNPVO determines the key environmental objectives and priority tasks based on the assessment of the situation in the environment and prevailing trends.	Natural resources Air Climate factors	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
	(Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], no./06)	<p>The tasks and objectives must be completed prior to the expiry of the programme if not determined otherwise. The ReNPVO is the basis of the environmental dimension of Slovenia's Development Strategy, which defines the vision for Slovenia's future as well as guidelines and measures for the realisation of this vision by 2013.</p> <p>The objectives and measures were determined under four areas, i.e.: climate change, nature and biodiversity, quality of life and waste and industrial pollution.</p> <p>The basic objectives in individual areas are as follows:</p> <ul style="list-style-type: none"> – emphasise climate change as an important challenge in the coming years, reduce greenhouse gas emissions and thus contribute to the long-term objective of stabilising greenhouse gas concentrations in the atmosphere, as well as reduce emissions of substances that cause depletion of the ozone layer; – protect and conserve natural systems, habitats and wildlife in order to halt the loss of biodiversity, genetic diversity and further soil degradation; – contribute to a high quality of life and the social welfare of citizens by providing an environment where pollution does not negatively affect human health or the environment and by promoting sustainable development in towns and especially by taking measures to establish a good status of surface and ground water, and for sustainable handling and management of waters, which includes care for hydrologic balance and the rational consumption of water as a natural resource; - waste management and the use of renewable and non-renewable natural resources, which enable sustainable production and consumption, contribute to reducing environmental pollution and the use of energy by not exceeding the carrying capacity of the environment. 	Water Nature Human health	

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
European document	Thematic Strategy on the sustainable use of natural resources COM(2005) 670 fin, December 2005	<p>The strategic approach for attaining the sustainable use of natural resources must gradually improve the efficiency of resources and reduce negative environmental effects in such a way that general environmental achievements will be realised simultaneously with economic growth. In practice, this means reducing the environmental impact of the use of resources with simultaneous improvement of efficiency of the use of sources in the entire economy of the EU. In this way, renewable energy sources will not be overexploited.</p> <p>The strategy emphasises the importance of including environmental issues in other policies that influence the environmental impacts of the use of natural resources.</p>	Natural resources	1
National document	Environmental Protection Act (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], No. 39/06 – official consolidated text, 49/06 - ZMetD, 66/06 - CC Decision of the Constitutional Court, 33/07 – ZPNačrt, 57/08 – ZFO-1A, 70/08, 108/09, 108/09 – ZPNačrt-A, 48/12, 57/12, 92/13, 56/15, 102, 15 and 61/17 – GZ)	<p>To promote sustainable development, environmental protection requirements must be included in the preparation and implementation of policies and activities in all fields of economic and social development.</p> <p>The Act regulates environmental protection against pollution as the fundamental objective for sustainable development, and within this framework, determines the fundamental principles of environmental protection, measures for environmental protection, monitoring of the state of the environment and information on the environment, economic and financial instruments of environmental protection, public services of environmental protection and other issues related to environmental protection. The environmental protection objectives are especially:</p> <ol style="list-style-type: none"> 1. protect and reduce environmental pollution; 2. conserve and improve the quality of the environment; 3. sustainable use of natural resources; 4. reduce energy consumption and use more renewable 	Natural resources Air Climate factors Water Nature Human health	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>energy sources;</p> <p>5. eliminate the consequences of environmental pollution, readdress the natural balance and re-establish its regeneration capacity;</p> <p>6. enhance material efficiency of production and consumption; and</p> <p>7. ban the use of hazardous substances and find an alternative.</p>		
European document	<p>COM (2010) 2020 fin. – EUROPE 2020 Strategy for smart, sustainable and inclusive growth is the vision of the social market economy of Europe for the 21st century;</p> <p>COM(2011) 571 – Time frame for Resource Efficient Europe</p>	<p>In its communication entitled "Europe 2020 – Strategy for smart, sustainable and inclusive growth", the Commission emphasised that social cohesion, the green economy, education and innovation are important for the European area.</p> <p>The strategy for the sustainable use of natural resources is an integral part of the strategy of impacts generated by the use of natural resources in a growing economy – a concept known as ‘decoupling’. In practice, translates to the following objective: "Reducing the environmental impact of the use of resources with the simultaneous improvement of efficiency of the use of sources in the entire economy of the EU. In this way, renewable energy sources will not be overexploited.</p> <p>In order to reach this objective, the strategy includes measures for:</p> <ul style="list-style-type: none"> - improving our understanding and knowledge of the use of resources in Europe, their negative environmental impact and their importance in the EU and the world as a whole, - developing tools for monitoring and reporting on progress in the EU, member states and economy sectors; - promoting the use of strategic approaches and procedures in economy sectors and member states, and 	Natural resources	1

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>promoting plans and programmes suitable for development, and</p> <ul style="list-style-type: none"> - increasing the awareness of interest groups and citizens regarding the important negative environmental impact of using resources. 		
European document	Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC)	<p>The Directive has the objectives of:</p> <ul style="list-style-type: none"> - reducing water pollution caused or induced by nitrates from agricultural sources and - preventing further such pollution. 	Water	3, 4, 10
European document	The Thematic Strategy for Soil Protection – COM(2006)231	<p>The strategy takes into account the various functions of soil, diversity and complexity of soil and numerous degradation processes to which soil can be subjected.</p> <p>The strategic goal is the protection and sustainable use of soil, which is based on the following guiding principles:</p> <ul style="list-style-type: none"> - preventing further degradation of soil, and maintaining the functions of soil when soil is being used and when the functions of soil are being exploited and when soil serves as a receptor of the effects of human activity or environmental phenomena - recovery of degraded soil to the point of functionality, which complies with at least the existing or envisaged use of soil. 	Natural resources	1
National document	Waste management programme and waste prevention programme (adopted at the 94th regular session of the Slovenian Government as of 30 June 2016)	The main purpose of the programme implementation is for Slovenia to follow the strategic guidelines of European policies that by emphasising the prevention of waste generation, priority is given to the preparation of waste for reuse and their recycling before energy processing of waste, waste reprocessing is given priority before its removal, if and where this is the best possibility from environment protection aspect and by considering technical feasibility and economic rationality.	Natural resources	1

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
National document	Resolution on the strategic guidelines on developing Slovenian agriculture and the food industry by 2020 – ‘Securing Food for Tomorrow’ (ReSURSKŽ) (Official Gazette of the Republic of Slovenia, no. 25/11)	<p>Ensuring food security with a stable production of safe and high-quality food accessible to consumers</p> <p>Increasing the competitiveness of agriculture and the food industry</p> <p>Sustainably using production potential and ensuring agriculture-related public assets</p> <p>Ensuring compliant and socially sustainable rural development (in cooperation with other policies)</p>	Natural resources	1
National document	Strategy for the implementation of the Resolution on the strategic guidelines for developing Slovenian agriculture and the food industry up to 2020 (adopted by the Slovenian Government on 12 June 2014)	<p>OPERATIONAL GOALS:</p> <ul style="list-style-type: none"> - To ensure 350,000 ha of permanently protected farm land; - To increase or preserve the scope of production by building new irrigation systems per 5,000 ha of farm land; - To increase self-supply with vegetables to 50%, self-supply with pork to 70%, increase the purchase of bread wheat, intended for food per 130,000 tonnes and increase eco production that will be carried out by 5,000 farms on 55,000 ha. <p>(Selected) Strategic and developmental goal:</p> <ul style="list-style-type: none"> - the preservation of wine growing areas, - the preservation of the identity of cultural landscape and connecting olive trees and olive oil with tourism, - achieving a 3% global share of hop production and stabilising production with regard to offer that is sustainable quantitatively and qualitatively. <p>The measures for adapting to climate change are envisaged.</p>	Natural resources	1
European	A new EU Forest Strategy: for	The Forest Strategy for forests and the forest-based sector	Natural resources	1

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
document	forests and the forest-based sector (COM(2013)659 final as of 20 September 2013)	<p>was adopted because there is no other common EU forest policy or leading framework for issues regarding forests. Sector policies had to be harmonised because of the increasing need for forests due the the rising number of EU policies.</p> <p>The purpose of this strategy is to make forests and the forest-based sector the primary target of efforts to transfer to green economy and evaluate the benefits that forests can ensure sustainably and to simultaneously ensure their protection.</p> <p>2020 forest objectives: To ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles and that the EU's contribution to promoting sustainable forest management and reducing deforestation at global level is strengthened, thus:</p> <ul style="list-style-type: none"> - contributing to balancing various forest functions, meeting demands and delivering vital ecosystem services; - providing a basis for forestry and the whole forest-based value chain to be competitive and viable contributors to the bio-based economy. 		
National document	Forest Act (ZG) (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], nos. 30/93, 56/99 – ZON, 67/02, 110/02 – ZGO-1, 115/06 – ORZG40, 110/07, 106/10, 63/13, 101/13 – ZdavNepr, 17/14, 22/14 – Ruling of the Constitutional Court, 24/15, 9/16 – ZGGLRS and 77/16)	The act regulates the protection, cultivation, exploitation, use and the disposal of forests as a natural asset in order to ensure sustainable and multipurpose management in accordance with the principles of protecting the environment and valuable natural features as well as sustainable and optimum functioning of forests as a ecosystem and realise their functions.	Natural resources	1

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
National document	Resolution on the National Forestry Programme (Report on the Implementation of the National Forestry Programme by 2014, Operational Programme for the Implementation of the National Forestry Programme)	<p>The National Forestry Programme (NGP) is a fundamental strategic document aimed at determining the national policy of sustainable development of forest management. The main principles of the NGP are directed to the preservation of forests and provision of multipurpose role, which includes the environmental, social and economic aspect. On the basis of the current situation and set goals, it contains a long-term vision of management, which, besides development guidelines of a restricted forestry sector, also defines relationships from the area of environmental protection and nature conservation, economic sectors related to wood processing and all other sectors interest-related with forests and forest land.</p> <p>With the system of spatial planning, which determines the eligible use of lands, forests are included in spatial plans at the national and local level. A system of forest management planning has been developed for the management of forests as a natural resource.</p>	Natural resources	1
National document	Action plan to increase the competitiveness of the forest-wood chain in Slovenia until 2020.	<p>Operational document for for increasing the competitiveness of the entire forest-wood chain. The document defines wood as a strategic raw material of Slovenia.</p> <p>Goals:</p> <ul style="list-style-type: none"> - Creating a market for wood products and services; - Accelerating felling and improving the maintenance of forests; - Increasing the quantity and processing of wood at higher levels of complexity and with new technologies; - New jobs; 	Natural resources	1

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		- Increasing added value per employee in the wood processing industry.		
National document	Regional forest management and hunting management plans (2011–2020)	<p>According to the Forest Act, the ownership right for forests is executed by ensuring their ecological, social and production functions. The forest owner must therefore manage their forests in accordance with the forest management and forest growth plan.</p> <p>Plans regulate the use of forest areas, the intended use of forest and environmental impacts caused by tourism (unregulated walking paths, driving motocross bikes, driving cars, driving snowmobiles, riding horses on terrain, inappropriate time and form of cutting).</p>	Natural resources	1
National document	National renewable energy action plan for the 2010–2020 period (AN OVE) (currently in renewal)	<p>The development of RES goals by 2020 with a view to 2030, reaching at least 25% RES in final energy consumption.</p> <p>The AN OVE indicates possible locations for using RES.</p>	Natural resources Climate factors	1, 8
National document	Action plan for energy efficiency for the 2014–2020 period	<p>Goals:</p> <ul style="list-style-type: none"> - Improving energy efficiency by 20% by 2020, meaning that the use of primary energy in 2020 will not exceed 7,125 million tonnes (it cannot be increased by more than 2% in comparison with 2012). - The obligation to renew 3% of national buildings' surface every year. - To ensure that every new building owned and used by public authorities will be zero-energy from 2018 and from 2020 onwards in other sectors. <p>Connection with the SDSS:</p> <ul style="list-style-type: none"> - Energy restoration as part of functional renovation - Determination of priority areas for functional renovation, including energy renovation - Sustainable urban development – including the 	Natural resources Climate factors	1, 8

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		renovation of national buildings		
National document	Energy Concept of Slovenia (in preparation)	<p>Vision:</p> <ul style="list-style-type: none"> - By 2055: Reducing green house gas emissions related to energy consumption by at least 80% with regard to the 1990 level. - By 2035: Reducing green house gas emissions related to energy consumption by at least 40% with regard to the 1990 level. <p>Connection with the SDSS:</p> <ul style="list-style-type: none"> - Determining priority areas for renewable energy sources; - Guidelines to support sustainable mobility implementation, in connection to the priority area: functional urban areas, the countryside and green systems; - Guidelines for introducing energy systems for efficient remote heating organisation, in connection to the priority area: functional urban areas, the countryside and green systems. 	Natural resources Climate factors	1, 8
European document	<p>Directive 2016/2284/EC on national emission ceilings</p> <p>Gothenburg Protocol to the Convention of the United Nations Economic Commission for Europe on Long-Range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-Level Ozone</p>	The new Directive 2016/2284/EU on national emission ceilings that includes updated and verified important health risks and environmental impacts generated by air pollution in the EU has been drafted for air pollutant emission ceilings for each Member State by 2030. By adopting the new Directive, European Union law has been harmonised with new international commitments following a revision of the Gothenburg Protocol in 2012. Directive 2016/2284/EU is the main legislative pillar of the EU to attain the Union's long-term objective to achieve levels of air quality that do not generate significant risks to human health and the environment.	Air	2

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		Directive 2016/2284/EU on national emission ceilings repeals and substitutes the current regime of the EU for annual national emission ceilings of air pollutants as defined in Directive 2001/81/EC. Thus it ensures that national emission ceilings for SO ₂ , NO _x , NMHOS and NH ₃ from Directive 2001/81/EC will be applied between 2010 and 2020 and determines new national commitments regarding reducing emissions that will be applied for SO ₂ , NO _x , NMHOS, NH ₃ , particulates (PM _{2,5}) and methane (CH ₄) from 2020 and 2030 and intermediate emission levels of the same pollutants for 2025.		
European document	Directive 2008/50/EC	Directive 2001/81/EC establishes the objectives regarding ambient air quality in order to avoid, prevent or reduce harmful effects on human health and the environment as a whole. Emissions of pollutants must not exceed limit or target values for SO ₂ , NO _x , PM ₁₀ , PM _{2,5} and other pollutants (NO ₂ , Pb, CO, benzene, ozone, HOS and NH ₃).	Air, human health	2, 11
European document	'Clean Air for Europe' Programme	In its 'Clean Air for Europe' Programme, the Commission emphasises that the air quality in Europe has significantly improved in recent decades. However, air pollution remains the main environmental factor related to diseases that could be prevented and early mortality rates in the EU, and at the same time, has a negative effect on a considerable area of the European natural environment. According to the OECD data, "urban air pollution is set to become the primary environmental cause of mortality worldwide by 2050, ahead of polluted water and lack of sanitary services".	Air, human health	2, 11
National document	Operational programme for the protection of ambient air against pollution caused by PM ₁₀	Regarding compliance with the requirements of Directive 2008/50/EC, which stipulates that Member States must prepare programmes of measures to ensure that PM ₁₀ concentrations in ambient air do not exceed the	Air, human health	2, 11

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>ceilings, the Operational programme for the protection of ambient air against pollution caused by PM₁₀ has been adopted.</p> <p>The Operational programme for the protection of ambient air against pollution caused by PM₁₀ determines holders and bases for the preparation, adoption and implementation of detailed plans of measures in order to protect human health in areas where ceilings of PM₁₀ concentrations are exceeded. More detailed plans to reduce exposure to harmful effects of particulates in ambient air were adopted by the Government of the Republic of Slovenia in the form of ordinances on the air quality plan for the municipalities of Kranj, Celje, Novo Mesto, Maribor, Murska Sobota and Ljubljana and for the area of Zasavje.</p>		
European document	EU Strategy on adaptation to climate change (COM(2013) 216 final)	The general objective of the EU Adaptation Strategy is to contribute to a more climate-resilient Europe. This means enhancing the preparedness and capacity to respond to the impacts of climate change at the local, regional, national and EU levels, developing a coherent approach and improving coordination.	Climate factors	8, 9
European document	Decision No 406/2009/EC on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments	<p>Decision 406/2009/EC lays down the minimum contribution of Member States to meeting the greenhouse gas emission reduction commitment of the Community for the period from 2013 to 2020 for greenhouse gas emissions covered by this decision, and the rules on making these contributions and for the evaluation thereof.</p> <p>The commitment to reduce greenhouse gas emissions from Decision No 406/2009/EC refers to:</p> <ul style="list-style-type: none"> - emissions from the use of fuels in households and the service sector; - emissions from the use of fuels in transportation; 	Climate factors	8, 9

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<ul style="list-style-type: none"> - emissions from the use of fuels in small and medium-sized enterprises in industry and the energy sector; - fugitive emissions from the energy sector; - process emission from industrial procedures; - the use of solvents and other products; - emissions from agriculture; - emissions from waste management. <p>Slovenia's objective by 2020 is for greenhouse gas emissions not to exceed 4 percent in comparison with 2005 and to reduce values to below 12,117 kt of CO₂ equivalent. The commitment to reduce greenhouse gas emissions does not refer to the period up to 2020, since Slovenia also has legally binding annual targets, i.e. in the 2013–2020 period, greenhouse gas emissions must not exceed the target annual emissions determined by linear trajectory by 2020.</p>		
National document	Operational programme for limiting greenhouse gas emissions until 2020	<p>The proposed Operational Programme for Reducing Greenhouse Gas Emissions by 2020 is also in the process of being adopted, it distributes commitments to reduce greenhouse gas emissions as per Decision No 406/2009/EC between individual sectors, and determines measures to attain the objectives so as to reduce climate policy costs to a minimum also over a longer period. The indicative sectoral objectives to reduce greenhouse gas emissions which facilitate the attainment of the objectives of Decision No 406/2009/EC are as follows:</p> <p>7.2.1 - halt the quick growth of emissions from transportation so that they do not exceed 18 percent by 2030 in comparison with 2005 (which is a 15 percent reduction by 2030 in comparison with 2008) with a vision to reduce emissions by 90 percent by 2050;</p> <p>8.2.1 - in general consumption, a reduction of 66</p>	Climate factors	8, 9

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>percent in comparison with 2005, with a vision of carbon-free energy use in the sector by 2050;</p> <p>9.2.1 - the objective in agriculture is to manage TGP emissions at the level of a maximum of 6 percent by 2030 in comparison with 2005, while increasing Slovenia's food self-sufficiency;</p> <p>10.2.1 - reduce emissions in industry by 32 percent by 2030 in comparison with 2005, with a vision of a 90 percent reduction by 2050;</p> <p>11.2.1 - reduce emissions in waste management by 57 percent by 2030 in comparison with 2005, with a vision of a 90 percent reduction by 2050;</p> <p>12.2.1 - the objective in the energy sector (fuel combustion, fugitive emissions) is for emissions not to grow by more than 27 percent by 2030, with a vision of carbon-free energy supply by 2050.</p>		
European document	A policy framework for climate and energy in the period from 2020 to 2030 (COM(2014) 15 final)	<p>A policy framework for climate and energy in the period from 2020 to 2030 is founded on:</p> <ul style="list-style-type: none"> - a greenhouse gas emission reduction target for domestic EU emissions of 40 percent in 2030 relative to emissions in 1990, - the binding EU level target of at least 27 percent of the share of renewable energy to be consumed in the EU by 2030, - at least 27 percent framework EU target to improve energy efficiency by 2030, and - a 15 percent target for mutual connections of electric power systems. 	Climate factors	8, 9
European document	Directive 2000/60/EC (Water Framework Directive)	Directive 2000/60/EC determines measures for the attainment of the strategic objective of a good ecological status of waters in 2015.	Waters	3, 4
European document	Directive 2008/56/EC on establishing a framework for community action in the field	Directive 2008/56/EC determines the framework within which Member States must take the necessary measures 'to achieve or maintain a good environmental status in	Waters	5

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
	of marine environmental policy (Marine Directive)	the marine environment' by 2020, which is also related to the ban of disposing waste into the sea.		
National document	Marine Environment Management Plan 2017–2021 (May 2017)	The Marine Environment Management Plan 2017–2021 incorporates: <ul style="list-style-type: none"> - the assessment of seawater, including the description of key features and characteristics of the marine environment, determining the objectives and good condition of a marine environment, determining anthropogenic pressures on marine environment and the socio-economic analysis of the marine environment, - seawater monitoring programme, and - the programme of measures for the attainment of a good condition of marine environment. 	Waters	5
European document	Directive 2008/105/EC on environmental quality standards in the field of water policy	This directive determines the environmental quality standards for priority substances and other pollutants, as determined in Directive 2000/60/EC with the objective of achieving a good chemical status of surface waters and, in accordance with the provisions and objectives of Directive 2000/60/EC on the prevention of emission of substances into waters, with separation of wastewater. The implementation of the regulation transposing Directive 2008/105/EC in Slovenian legislation regulates the following in relation to the objectives of a good ecological status of waters by 2015: <ul style="list-style-type: none"> - criteria for the evaluation of the chemical status of surface waters, and - environmental objectives on the abandonment or termination of discharge of certain substances in the aquatic environment. 	Waters	3
European document	Council Directive 98/83/EC on the quality of water intended for human consumption	Council Directive 98/83/EC regulates the quality of water intended for human consumption. Water is wholesome and clean if it is free from any microorganisms, parasites	Human health – drinking water	10

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>and from any substances which, in numbers or concentrations, constitute a potential danger to human health.</p> <p>The objective of this directive is to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean.</p>		
European document	Directive 2006/118/EC on the protection of groundwater against pollution and deterioration	<p>Directive 2006/118/EC on the protection of groundwater against pollution and deterioration establishes specific measures to prevent and control groundwater pollution in accordance with Directive 2000/60/EC. These measures primarily include:</p> <ul style="list-style-type: none"> - criteria for assessing the good chemical state of groundwater and - criteria for the identification and reversal of significant and sustained upward trends and for the definition of starting points for trend reversals. <p>The goal: “Good chemical status of groundwater must be attained by 2015”.</p>	Waters Human health – drinking water	4, 10
European document	Directive 2007/60/EC on the assessment and management of flood risks (Floods Directive)	<p>The Directive determined transboundary negotiations regarding flood risk management and includes important commitments to enhance transparency and the integration of citizens.</p> <p>The objective of the flood risk management directive is to reduce the risks and adverse consequences of floods in the European Union.</p>	Waters Population and material assets	3, 14
National document	Flood Risk Reduction Plan 2017–2021 (July 2017)	<p>The Flood Risk Reduction Plan 2017–2021 (July 2017) includes:</p> <ul style="list-style-type: none"> - flood risk assessment for water management areas; - flood danger maps and flood risk maps; - the description of objectives in relation to managing 	Waters Population and material assets	3, 14

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		flood risk; - the summary of measures and their distribution by priorities, - cost-benefit analysis.		
National document	Waters Act (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], nos. 67/02, 2/04 - ZZdri-A, 41/04 - ZVO-1, 57/08, 57/12, 100/13, 40/14 and 56/15)	The purpose of the Waters Act is to achieve a good status of waters and other water-related ecosystems, ensure protection against harmful effects of water, conserve and balance water quantities, and promote the sustainable use of waters, which facilitates various types of water use by taking into account the long-term conservation of available water sources and their quality.	Waters Human health – drinking water	3, 4, 5, 10
National document	Water Management Plan – WMP (Decree on the river basin management plan for the Danube Basin and the Adriatic Sea Basin (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], nos. 61/11, 49/12, 67/16)	The River basin management plan for the Danube Basin and the Adriatic Sea Basin 2016–2021 include: - the description of features of surface and groundwater areas, - the description of important water burdens, - situation monitoring networks maps and maps presenting the situation monitoring results, - the list of environmental goals for surface waters, groundwater and protected areas, - the summary of water usage economic analysis, - the summary of a programme or programmes of measures to achieve environmental goals, and - the summary of implemented public notification measures and public consultations. The main environmental objectives for surface waters are to: - Prevent deterioration of the status of surface waters and ensure the attainment of a good ecological status/potential and a good chemical status of surface waters by 2021. The objectives to reduce pollution with priority substances and eliminate emissions of priority hazardous substances in order to achieve concentrations	Waters	3, 4, 5

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>near the natural background values are also related to achieving a good chemical status of waters.</p> <p>The environmental objective for bodies of groundwater is to:</p> <ul style="list-style-type: none"> - achieve their good chemical and quantity status by 2021. 		
European document	Council Directive 79/409/EEC of on the conservation of wild birds	The Directive established an extensive protection system for all species of wild birds in the Union. The Directive acknowledges that the loss and degradation of habitats is the greatest threat to bird conservation in the Union. Therefore, a great deal of attention is given to conserving the habitats of endangered species. For all species of birds referred to in Annex I to the Directive and for all regularly occurring migratory species in need of protection, Member States must form special protection areas (SPA), also called Natura 2000 sites. In SPAs, Member States must establish that the populations of the protected species are in a favourable situation.	Nature	6, 7
European document	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	The Directive on habitats in the second paragraph of Article 6 requires that Member States from the day of their accession to the European Union prevent the deterioration of natural habitats and the habitats of species, as well as the disturbance of species for which the Natura 2000 areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this directive. This provision applies to proposed special protection areas (SCI), as determined in accordance with the criteria and procedures of the Directive on habitats (fifth paragraph of Article 4).	Nature	6, 7
European document	EU Biodiversity Strategy to 2020 (COM(2011) 244	This strategy realises two important commitments, i.e. to halt the loss of biodiversity in the EU by 2020, and to protect, evaluate and restore biodiversity and ecosystem services in the EU by 2050.	Nature	6, 7

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>The objective of this Strategy is to halt the loss of biodiversity and the deterioration of ecosystems in the European Union by 2020 by defining six priority targets:</p> <ul style="list-style-type: none"> - Target 1: Preserving and restoring nature. - Target 2: Maintaining and improving ecosystems and their services (restoration of at least 15 percent of damaged areas). - Target 3: Ensuring sustainable agriculture, forestry and fishery. - Target 4: Ensuring the sustainable use of fisheries resources. - Target 5: Combating invasive alien species, which threaten 22 percent of native EU species. - Target 6: Measures to prevent biodiversity loss. 		
European document	Bern Convention (Bern, 1979)	Convention on the Conservation of European Wildlife and Natural Habitats. The main objective is to conserve European wild flora and fauna and their natural habitats.	Nature	6
European document	Ramsar Convention (Ramsar, 1971)	<p>Ramsar Convention – the signatories to the Convention have undertaken to:</p> <ul style="list-style-type: none"> - place wetlands on the List of Wetlands of International Importance and preserve and maintain their ecological balance; - include the conservation of wetlands in national development programmes and plan the comprehensive management of wetlands by observing the principle of sustainable use; - support development policies for the conservation of wetlands in their respective territories by designating protected areas and supporting the professional training of wetland researchers and operators; - cooperate with other signatories on areas of wetlands located along borders and areas of hydrological systems, as well as on joint development projects directed at wetlands. 	Nature	6, 7

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
European document	Convention on the Protection of the Alps (Alpine Convention, 1991)	Alpine Convention – the main objective is to preserve the Alps as a habitat for people and flora and fauna. The Framework Convention was adopted by the European Union and eight Contracting Parties (Austria, Germany, France, Italy, Liechtenstein, Monaco, Slovenia and Switzerland). The Alpine Convention was signed in 1991, it comprises the Framework Convention, protocols and two declarations. It entered into force in 1995, and contributes to the preservation of the qualities and special features of the Alps regardless of state borders and promotes international cooperation.	Nature Conservation of landscape	6, 7, 17
National document	Nature Conservation Act (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], Nos 96/04 – official consolidated version, 61/06 – ZDru-1, 8/10 – ZSKZ-B and 46/14)	The regulation establishes a comprehensive system for nature preservation with the purpose of protecting valuable natural features and preserve biodiversity. It defines the subjects of protection, ways and measures of protection, organisation in the area of nature protection, funding of nature protection, programming and planning of nature protection and other content necessary for effective nature protection. Listed among the protected subjects in the area of preservation of biodiversity that are determined or determinable as priorities, are habitat types which are preserved as a priority in a favourable condition, habitats of protected and internationally protected species, areas of ecological importance and special protected areas (hereinafter referred to as: Natura 2000 sites), which create the European ecological network. The protected subjects are also endangered, protected and internationally protected animals and plants in the wild.	Nature	6, 7
National document	Natura 2000 management programme for the period from 2015 to 2020 (Ministry of the Environment and Spatial Planning, 2015)	The main purpose of the operational programme is to define the implementation of obligations of protection of special protected areas - the Natura 2000 areas - to which Slovenia is committed under the Directive on birds and the Directive on habitats, which means to preserve and	Nature	7

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>increase biodiversity in the EU by enabling sustainable development. A part of this objective is to promote the traditional coexistence of humans and nature.</p> <p>The main tasks of the programme are to:</p> <ul style="list-style-type: none"> - define in detail the protection objectives and measures in the Natura sites; - define relevant sectors and responsible holders for the implementation of protection measures; - enable horizontal connections with strategic plans and development programmes of the Government; - take advantage of the opportunities of the Natura 2000 sites for local and regional development, jobs and economic growth, taking into account the economic, social and demographic features and principles of sustainable development; - prepare a review of the missing research, studies and data to be included in research programmes. 		
National document	<p>Strategy for Biodiversity Conservation in Slovenia (2002–2012) (MOP, 2001)</p> <p>Analysis of achieving the objectives of the Strategy for Biodiversity Conservation in Slovenia, Zavod Symbiosis, 2012</p>	<p>This is a strategic document adopted by the Government on 20 December 2001, which determined for the 2002–2012 a set of specific objectives and guidelines for the coordinated implementation of measures contributing to the attainment of three main goals of the Convention on Biological Diversity. These objectives are:</p> <ul style="list-style-type: none"> - conservation of biodiversity; - sustainable use of its components; - fair and just division of benefits of genetic resources. 	Nature	6, 7
European document	Directive 2002/49/EC relating to the assessment and management of environmental noise	The basic objective of this Directive is to define a common approach intended to prevent and reduce the harmful effects of noise pollution and ensure bases for introducing measures for reducing noise emitted by major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery.	Human health – Noise pollution	12

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
National document	Noise Action Programme for the first phase major roads and major railways outside the Municipality of Ljubljana 2012–2017,	The objective of the Operational Noise Action Programme is to improve the quality of life from the aspect of noise pollution for people who live in areas near the busiest railway lines and road connections.	Human health – Noise pollution	12
National document	Action plan for the implementation of the Strategy of the Government of the Republic of Slovenia for Children's Health Related to the Environment for the Period 2014–2020	<p>The main purpose is to ensure a healthy environment of the development of children and the youth, who are a vulnerable group, to reduce their exposure to noise factors (noise, polluted air, chemicals, etc.) and to ensure an environment that supports a healthy lifestyle (movement, healthy and locally produced food).</p> <p>From the aspect of human health protection spatial planning should consider the following: Urban gardens, minimal share of regulated green areas in urban centres, recreational areas, bathing areas, remoteness of residential areas, education institutions from main roads and other sources of environment pollution.</p>	Human health Population and material assets	11, 12, 14
European document	European Convention on the Protection of the Archaeological Heritage – Malta Convention (MEKVAD), Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], no. 24/1999)	<p>The Convention refers to comprehensive protection of archaeological heritage. It defines the connection between conservation of archaeological heritage and spatial planning. The Convention imposes on every signatory to:</p> <ul style="list-style-type: none"> - make efforts to coordinate and connect the requirements of archaeology and spatial planning and to secure the participation of archaeologists in spatial planning policies and the different phases of spatial planning; - ensure systematic consultations between archaeologists and urban planners or between those responsible for spatial planning, in order to enable changes to implementation plans that could harm archaeological heritage and enough time and resources for the implementation of an adequate scientific study on the 	Conservation of cultural heritage	16

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>spot and for the publication of results;</p> <ul style="list-style-type: none"> - ensure that archaeological sites and their locations will be fully taken into account in environmental impact assessments and decisions adopted on that basis; - ensure that parts of archaeological heritage found during spatial interventions will be preserved on the spot (in situ) if possible; - ensure that archaeological sites are accessible to the public and that the access path for larger numbers of visitors does not harm the archaeological and scientific features of these sites and their surroundings. <p>Objective: "Archaeological sites and their settings must be fully taken into account in programmes and policies and the integration of activities. Parts of archaeological heritage found during activities at sites must be preserved in situ if possible."</p>		
European document	<p>Convention for the Protection of the Architectural Heritage of Europe – Granada Convention (Official Gazette of the SFRY, no. 4-11/1991; Act Notifying Succession to Conventions of the Council of Europe, Geneva Conventions and Additional Protocols on the Protection of War Victims and International Treaties from the Area of Armament Control Whose Depositories are the Three Major Nuclear Powers, Official Gazette of the Republic of Slovenia, no. 14/1992)</p>	<p>The convention strengthens the concept of the comprehensive protection of architectural heritage (monuments, architectural units, memorial sites). The convention imposes on every signatory to:</p> <ul style="list-style-type: none"> - perform adequate monitoring and exercise powers as requested by the legal protection of such structures; - prevent damage, decay or demolition of protected real estate. <p>The policy of the comprehensive protection of architectural heritage the signatories are obliged to adopt:</p> <ul style="list-style-type: none"> - includes the protection of architectural heritage as an important objective of spatial planning and urban planning; - promotes programmes for the reconstruction and maintenance of architectural heritage; - makes sure that the protection, revitalisation and 	Conservation of cultural heritage	16

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>improvement of architectural heritage become an important feature of policies in the field of culture, environmental protection and spatial planning;</p> <ul style="list-style-type: none"> - promotes in the procedures of spatial planning and urban planning, where possible, the protection and use of structures whose purpose alone does not justify the protection, but which are important as part of the urban or rural environment and as an element of the quality of life; - promote the use and development of traditional skills and materials which are important for the future of architectural heritage. <p>Objective: “The protection of architectural heritage as an important goal of spatial planning and urban planning.”</p>		
European document	Davos Declaration, “Towards a high-quality Baukultur for Europe”, Conference of Ministers of Culture, 20 to 22 January 2018, Davos, Switzerland;	The declaration emphasises the role of culture as the main role in the quality of our living environment. It reminds us that buildings create a space for culture, and at the same time, they are its reflection. It emphasises common responsibility of politics and society in the built environment and thus requires the formation of a joint and comprehensive European policy for the achievement of quality built environment. Guaranteeing quality development of built places and diligent landscape management are two of the main challenges faced by today’s society and the culture of building our future. Objectives include cultural heritage as well as modern architecture and construction.	Conservation of cultural heritage	16
European document	European Cultural Heritage Strategy for the 21st Century (Recommendation of the Committee of Ministers to Member States on the European Cultural Heritage Strategy for the 21st Century,	The strategy emphasises the new role of cultural heritage in Europe and provides guidelines for facilitating the good cooperation of all stakeholders who are involved in heritage management, whereas management encompasses the identification, assessment and management in a narrower sense. It expands innovative approaches that contribute to improving the environment and the quality	Conservation of cultural heritage	16

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
	CM/Rec(2017)1)	to European citizens. It sets challenges, recommends measures and emphasises best practice cases that should be considered by all stakeholders – governments, local communities, civil society, the economy and experts.		
European document	Council conclusions of 21 May 2014 on cultural heritage as a strategic resource for a sustainable Europe (OJ EU, no. 2014/C 183/08)	Cultural heritage consists of the resources inherited from the past in all forms and aspects. The European Commission and the Member States were given a task to consider cultural heritage as a whole in their policies and strategies, thus enhancing the role of cultural heritage in sustainable development.	Conservation of cultural heritage	16
European document	Act Ratifying the Convention on the Protection of the Underwater Cultural Heritage (MKVPKD) (Official Gazette of the Republic of Slovenia – International Treaties, no. 1/08)	The convention recognises the importance of underwater cultural heritage as an integral part of humanity's cultural heritage and as an especially important element in the history of peoples, nations and their mutual relationships in connection to their joint heritage. The purpose of the convention is to ensure and strengthen the protection of underwater cultural heritage for humanity's benefit in accordance with the convention's provisions.	Conservation of cultural heritage	16
European document	Act Ratifying the Council of Europe Convention on the Value of Cultural Heritage for Society (Official Gazette of the Republic of Slovenia – International Treaties, no. 5/08)	Convention signatories have recognised that the rights to cultural heritage are part of the right to participation in cultural life as is determined in the General Declaration on Human Rights and they recognise the accountability of individuals and the community for cultural heritage, they emphasise that human development and the quality of life are the goal of conserving cultural heritage and its sustainable use and they shall adopt necessary measures to use the convention provisions regarding the role of cultural heritage in building a peaceful and democratic society and sustainable development as well as motivating cultural diversity, and for a more harmonised cooperation among all public, institutional and private factors.	Conservation of cultural heritage	16
National document	Resolution on National Culture Plan 2014–2017 (ReNPK14-	The resolution stipulates that the conservation of cultural heritage and its sustainable use make an irreplaceable	Conservation of cultural heritage	16

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
	17) (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], no. 99/13)	<p>contribution to human development and the quality of life. By taking into account the role of cultural heritage in constructing an inclusive democratic society, and by emphasising cultural diversity and sustainable development, the concept of protection is being significantly expanded, evolving from protecting individual cultural monuments organised within professional institutions for physical protection against deterioration and changes to conserving wider areas with cultural and spatial identities to finally introducing cultural heritage as a source of economic, social and local development, which requires going beyond sectoral policies and including sectoral strategies, the active creation of opportunities for financial investments from various sources and partnerships with local communities.</p> <p>Programme objective: To enrich modern life by respecting cultural heritage, enhance access to cultural contents, to preserve the quality and present cultural heritage, to enhance heritage's recognition and to contribute to the economic development of areas.</p>		
National document	Cultural Heritage Protection Act (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], nos. 16/08, 123/08, 8/11, 30/11, 90/12, 111/13, 32/16)	<p>The act defines heritage protection as the preservation of material and substantial features of items, groups of items and structures or areas, care for their integrity and emphasise their importance as an essential component of modern life.</p> <p>The basic content and objectives of heritage protection are:</p> <ul style="list-style-type: none"> - maintaining and restoring heritage and preventing its endangerment; - providing material and other conditions for realising the cultural function of heritage, regardless of its intended function; 	Conservation of cultural heritage	16

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<ul style="list-style-type: none"> - ensuring public accessibility of heritage and facilitating the study and research of heritage; - preventing activities that could change the features, content, shape and, consequently, the value of heritage; - securing the implementation and development of the heritage protection system. 		
National document	Architectural Policy of Slovenia, "Architecture for the people", August 2017	This documents introduces a European cultural policy for architecture and, at the same time, establish a framework for an extensive discussion on the national architectural policy. Architectural policy has four fundamental goals: quality architecture, smart growth, sustainable development and inclusive architecture. Public interest in architecture comprises a higher quality of life and the living environment, and the introduction of sustainable development, social cohesion and cultural identity. It is facilitated by architectural, landscape architecture-related, urban and spatial planning, and the creation of interiors by considering space as a limited asset, including the conservation of the environment and cultural heritage.	Conservation of cultural heritage	16
European document	Act Ratifying the European Landscape Convention (MEKK) (Official Gazette of the Republic of Slovenia [Uradni list RS], no. 74/03)	<p>The Convention refers to landscapes considered to be exceptional, as well as unexceptional or degraded landscapes. Under the convention, all signatories are obliged to:</p> <ul style="list-style-type: none"> - legally recognise landscapes as an important component of the human environment, as an expression of diversity of the common cultural and natural heritage of humans and the foundation of their identity; - create and implement a landscape policy whose objectives are to protect, manage and plan landscapes on the basis of the adoption of special measures; - determine procedures for the participation of public, local and regional communities and other interested parties in defining and implementing landscape policy; 	Conservation of landscape	17

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>- include landscape in its policy of regional and urban planning, and in its cultural, environmental, agricultural, social and economic policies, and in all other policies which directly or indirectly influence landscape.</p> <p>The objectives of the convention are to:</p> <ul style="list-style-type: none"> - promote the protection, management and planning of landscapes; - establish European cooperation in solving issues related to landscape. 		
European document	Recommendation of the Committee of Ministers to Member States (Council of Europe) on the integrated conservation of cultural landscape areas as part of landscape policies (Recommendation No. R (95) 9)	The recommendation presents a starting point for expanding the concept of comprehensive conservation in the field of (cultural) landscape protection. The document recommends Member States a further inclusion of landscape protection policy in spatial planning as well as agricultural and forestry policies. The recommendation considers the conservation of cultural identity of living communities of people in connection to the conservation and enlargement of cultural landscape areas.	Conservation of landscape	17
National document	Slovenian Tourism Development Strategy 2012–2016 (RNUST)	<p>RNUST defines the vision of Slovenian tourism development.</p> <p>In 2016, tourism in Slovenia will be based entirely on sustainable development and will, as a very successful economic branch of national economy, importantly contribute to social welfare and the reputation of our country in the world. Slovenia will be a developed tourist destination with modern, diverse and high-quality tourism that will be based on innovative and quality integral tourist products, services with high added value and the aim of satisfying tourists. With attractive and diverse tourist products, it will become a desired destination for tourists from remote markets.</p> <p>The goal of the Slovenian tourism development is to</p>	Population and material assets	14

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		enlarge the scope of tourist activity (tourist turnover: revenues and profits from catering and tourist activities, the number of tourists, the number of overnight stays).		
National document	Slovenian Industry Policy – SIP (adopted by the Government of the Republic of Slovenia on 6 February 2013)	<p>By improving the business environment, supporting entrepreneurship and innovations, developing propulsive technological and industrial sectors able to react to social challenges, SIP's vision is to create conditions for the continuous restructuring of existing industry into an energy, resource, environmentally and socially sustainable industry of knowledge and innovations capable of creating new, long-term and quality jobs and being strongly integrated into international business flows. This is also the principal goal of SIP, which is reflected in increasing added value per employee (productivity) and the number of jobs for highly educated and skilled workers of all generations.</p> <p>Spatial aspect of ensuring the success of SIP: locations and accessibility of business zones and the connection with logistics centres, the quality of equipment (e.g. energy and digital communications, municipal equipment), the connection of industrial zones with settlement networks.</p>	Population and material assets	14
National document	Commodity Reserves Act (Official Gazette of the Republic of Slovenia [<i>Uradni list RS</i>], no. 96/09-UPB2, 83/12)	<p>The introduction of the state commodity reserves supply and formation system, from which the state draws resources to cover the needs of basic supply to the population and to maintain the appropriate level of supply during disturbances and instabilities in the market.</p> <p>State commodity reserves in cases of security threats and lack of self-sufficiency in the supply with basic food and non-food products that are necessary for people and for ensuring the key activities of the society present one of the fundamental tools for providing social and the</p>	Population and material assets	14

Document type	Environmental policies, programmes, plans, legislative acts	Purpose and objective	Connection to relevant environment areas	Connection to environmental objectives (consecutive number of objectives)*
		<p>individual's social and economic welfare and security.</p> <p>Spatial aspect: Spatial capacities, appropriate level of infrastructure are required, and the centre criterion is not necessary, although in cases of suburban locations the quality of infrastructure (Ortnek case) can present a problem. In the case of position in central areas, there can be an issue with expanding residential areas near warehouses (case of oil derivatives warehouses in Zalog) – non-harmonised planning, no possibilities to expand warehouses.</p>		
National document	Slovenia's Development Strategy by 2030, December 2017	<p>The central goal of Slovenia's Development Strategy 2030 is to ensure a high quality of life for all. It is achieved through a balanced economic, social and environmental development that creates the conditions and opportunities for the current and future generations. The quality of life for all people of Slovenia will be shown in:</p> <ul style="list-style-type: none"> - better opportunities for work, education and creativity, - decent, safe and active life in a healthy clean environment, - an active inclusion in democratic decision-making and co-management of the society. <p>The strategic guidelines of the state for achieving a high quality of life are:</p> <ul style="list-style-type: none"> • inclusive, healthy, safe and responsible society, • learning for and through life, • a highly-productive economy that generates added value for all, • preserved healthy natural environment, and • a high degree of cooperation, competence and effectiveness of governance. 	Population and material assets	14

Key:***Environmental objectives:**

- 1: Ensure the sustainable management of soil and forests
- 2: Ensure the realisation of long-term goals for annual air pollutant emission amounts
- 3: Prevent deterioration of the status of surface waters and ensure the attainment of a good ecological status/potential and a good chemical status of surface waters
- 4: Preserve or ensure a good quantitative and chemical status of groundwater
- 5: Ensure a good status of the marine environment
- 6: Protect and preserve biodiversity
- 7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected
- 8: Reduce greenhouse gas emissions
- 9: Reduce the vulnerability of infrastructure to climate change
- 10: Provide people with a safe supply of wholesome drinking water in sufficient quantities
- 11: Reduce the exposure of people to polluted air
- 12: Reduce the exposure of people to excessive noise levels
- 13: Prevent adverse effects on human health from the perspective of electromagnetic radiation and light pollution
- 14: Ensure optimum distribution of activities in the space
- 15: Ensure a good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk
- 16: Ensure comprehensive cultural heritage preservation
- 17: Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a quality landscape image

5.3 THE METHODOLOGY FOR ASSESSING THE IMPACTS OF SDSS 2050 GUIDELINES ON THE ENVIRONMENT

5.3.1 THE METHODOLOGY FOR ASSESSING THE IMPACTS OF SDSS 2050 ON THE ENVIRONMENT

The methodology of establishing and assessing impacts has been prepared on the basis of expert opinion. The impacts of the SDSS 2050 policies on individual segments of the environment and the environmental objectives has been evaluated by using appropriate criteria and have been classified into prescribed size classes in accordance with the Decree laying down the content of environmental report and on detailed procedure for the assessment of the effects on certain plans and programmes on the environment (Official Gazette of the Republic of Slovenia, [Uradni list RS] No. 73/05):

- Class A – no impact or the impact is positive;
- Class B – the impact is insignificant;
- Class C – impact is insignificant due to the implementation of mitigation measures;
- Class D – the impact is significant;
- Class E – the impact is destructive;
- Class X – determination of the impact is impossible.

The evaluations of results of SDSS 2050 implementation under classes A, B and C mean that the impacts of implementation on the realisation of environmental objectives are acceptable. The evaluations of results of SDSS 2050 implementation under classes D and E mean that the impacts of implementation on the realisation of environmental objectives are not acceptable.

Within the scope of the assessment of impacts on cultural heritage principally also includes the assessment of the impact on archaeological remains outside of registered archaeological sites. It is impossible to assess the impact on archaeological remains regarding the nature of the plan (national strategic document), the impact on archaeological remains is assessed at a lower level of strategic and executive spatial acts.

Indicators and evaluation criteria for categorisation in size classes by individual important environmental objectives are described below.

Description of assessment (evaluation) for individual areas of the environment and environmental objectives

- **Natural resources: land and forest**

Indicators with description of criteria for categorisation in size classes for environmental objective 1: Ensure sustainable management of soil and forests

Indicator	Size classes
Artificial surfaces – built and not built <i>(limitation of generation of new artificial surfaces prevents soil degradation)</i>	A – no impact/positive impact: the planned spatial development does not impact the degradation of soil or the reduction of preservation and resilience of forests and enables sustainable management of soil and forests. B – insignificant impact: the planned spatial development generates additional pressure on soil as non-renewable natural resource or on forest as renewable natural resource, although they will not be significant.
Priority areas of forest surface <i>(by integrating priority areas of forest surface in the SDSS the probability of ensuring rational use of forest land is greater)</i>	
Reworking construction waste and demolition waste <i>(greater the share of processed waste, smaller is the</i>	

degradation of soil due to the needs for mineral raw materials and waste deposit areas or areas for filling construction waste.

C – insignificant impact due to the implementation of mitigation measures: the planned spatial development could present substantial degradation of soil or the reduction of preservation or resilience of forests; mitigation measures must be considered.

D – significant impact: the planned spatial development presents an excessive degradation of soil or degradation of preservation and resilience of forests.

E – destructive impact: the planned spatial development presents a devastating impact on soil and forest.

X – determination of impact is not possible: the impact cannot be determined due to the lack of data.

- **Air**

Indicator with description of criteria for categorisation in size classes for environmental objective 2: Ensure the realisation of long-term goals for annual air pollutant emission amounts

Indicator	Size classes
<p>Annual quantity of air pollutant emissions from individual sectors (energy, traffic, industrial processes, processing, extensive use, agriculture)</p> <p><i>(The cumulative impacts of all measures of the SDSS must not cause the annual quantity of all emissions of an individual pollutant to exceed the aforementioned emission ceiling stipulated in the Operational Programme for complying with national emission ceilings for atmospheric pollutants.)</i></p>	<p>A – no impact/positive impact: the planned spatial development does not cause pollutant emissions into the air for which national emission ceilings have been determined. The implementation of measures will reduce pollutant emissions.</p> <p>B – insignificant impact: There is a possibility that the implementation of measures will increase pollutant emissions for which national emission ceilings have been determined, although not to the extent that the ceilings stipulated for transportation in the Operational Programme would be exceeded.</p> <p>C – impact is insignificant due to the implementation of mitigation measures: There is a possibility that the planned spatial development will increase pollutant emissions for which emission ceilings have been determined, to the extent that the ceilings stipulated in the Operational Programme would be exceeded. To reduce emissions, mitigation measures must be anticipated which ensure that the emission ceilings stipulated in the Operational Programme for transportation will not be exceeded.</p> <p>D – significant impact: The planned spatial development will increase pollutant emissions for which emission ceilings have been determined, to the extent that the ceilings stipulated in the Operational Programme will be exceeded.</p> <p>E – destructive impact: The planned spatial development will increase pollutant emissions for which emission ceilings have been determined to the extent that the ceilings stipulated in the Operational Programme will be significantly exceeded.</p> <p>X – determination of the impact is not possible: The impact cannot be determined due to the lack of data.</p>

- **Water**

Indicators with description of criteria for categorisation in size classes for environmental objectives 3, 4 and 5:

- Prevent deterioration of the status of surface waters and ensure the attainment of a good ecological status/potential and a good chemical status of surface waters
- Preserve or ensure a good quantitative and chemical status of groundwater
- Ensure a good status of the marine environment

Indicator	Size classes
Ecological and chemical status of surface waters <i>(spatial development cannot impact the degradation of ecological status/potential and chemical status of waters)</i>	<p>A – no impact/positive impact: The planned spatial development does not present any pressure on surface waters, groundwater or the status of the marine environment.</p> <p>B – insignificant impact: The planned spatial development can present additional pressure on surface waters, groundwater or the status of the marine environment, although their status or potential will not be aggravated.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development can present degradation of surface waters, groundwater or the status of the marine environment; mitigation measures must be considered.</p> <p>D – significant impact: The planned spatial development presents the degradation of surface waters, groundwater or the status of the marine environment.</p> <p>E – destructive impact: The planned spatial development has a destructive impact on surface waters, groundwater or the status of the marine environment: after the implementation of measures the status of waters or marine environment will be poor.</p> <p>X – determination of the impact is not possible: The impact cannot be determined due to the lack of data.</p>
Chemical and quantitative status of groundwater <i>(spatial development cannot impact the degradation of chemical and quantitative status groundwater)</i>	
Status of marine environment <i>(spatial development cannot deteriorate the status of marine environment)</i>	

- **Nature**

Indicator with description of criteria for categorisation in size classes for environmental objective 6: Protect and preserve biodiversity

Indicator	Size classes
Preservation state of protected and endangered plant and animal species <i>(the impact on the preservation state of protected and endangered plant and animal species due to the implementation of development, planned in the SDSS)</i>	<p>A – no impact/positive impact: The planned spatial development does not impact the biodiversity and ecologically significant areas or the impact is positive.</p> <p>B – insignificant impact: The implementation of SDSS does not significantly impact biodiversity and ecologically significant areas.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development and the implementation</p>

	<p>of mitigation measures do not significantly impact biodiversity and ecologically significant areas.</p> <p>D – significant impact: The planned spatial development significantly impacts biodiversity and ecologically significant areas.</p> <p>E – destructive impact: The implementation of SDSS has a destructive impact on biodiversity and ecologically significant areas. Mitigation measures are not possible.</p> <p>X – determination of the impact is not possible: The impact cannot be determined due to the lack of data.</p>
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Indicator with description of criteria for categorisation in size classes for environmental objective 7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected

Indicator	Size classes
Fragmentation of areas with nature conservation status <i>(guidelines to preserve the connection of green infrastructure have a positive impact on areas with nature protection status)</i>	<p>A – no impact/positive impact: The planned spatial development does not impact the areas with nature protection status or the impact is positive.</p> <p>B – insignificant impact: The planned spatial development does not significantly impact the areas with nature protection status.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development does not significantly impact the areas with nature protection status if mitigation measures are implemented.</p> <p>D – significant impact: The planned spatial development significantly impacts the areas with nature protection status.</p> <p>E – destructive impact: The planned spatial development has a destructive impact on the areas with nature protection status; mitigation measures are not possible.</p> <p>X – determination of the impact is not possible: The impact cannot be determined due to the lack of data.</p>

- **Climate factors**

Indicator with description of criteria for categorisation in size classes for environmental objective 8: Reduce GHG emissions

Indicator	Size classes
The reduction of annual quantity of greenhouse gas emissions from individual sectors (transportation, energy, industry, agriculture, waste management, extensive use)	<p>A – no impact/positive impact: The implementation of SDSS reduces greenhouse gas emissions more than envisaged in the Operational programme of measures to reduce greenhouse gas emissions by 2020.</p>

<p><i>(the planned reduction of greenhouse gas emissions from individual sectors cannot be lower than the reduction determined in the Operational programme of measures to reduce greenhouse gas emissions by 2020)</i></p>	<p>B – insignificant impact: The implementation of SDSS reduces greenhouse gas emissions will be reduced, although not more than envisaged in the Operational programme of measures to reduce greenhouse gas emissions by 2020.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The implementation of SDSS reduces greenhouse gas emissions will, with consideration of mitigation measures, reduce as envisaged in the Operational programme of measures to reduce greenhouse gas emissions by 2020.</p> <p>D – significant impact: The implementation of SDSS will reduce greenhouse gas emissions less than envisaged in the Operational programme of measures to reduce greenhouse gas emissions by 2020.</p> <p>E – destructive impact: The implementation of SDSS does not enable the reduction of greenhouse gas emissions. Mitigation measures are not possible.</p> <p>X – determination of impact is not possible: the impact cannot be determined due to the lack of data.</p>
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Indicator with description of criteria for categorisation in size classes for environmental objective 9: Reduce the vulnerability of infrastructure and settlements to climate change

Indicator	Size classes
<p>Adapting sector policies to climate changes</p> <p><i>(SDSS measures must also comprise measures to reduce or prevent the consequences of climate change, especially those that are caused by extraordinary weather conditions, rainfall regime changes and temperature rises)</i></p>	<p>A – no impact/positive impact: The implementation of the SDSS ensures the adaptation to climate change or such adaptation not have to be ensured.</p> <p>B – insignificant impact: The adaptation to climate change is ensured due to the implementation of SDSS.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The implementation of SDSS and the implementation of mitigation measures ensure the adaptation to climate change.</p> <p>D – significant impact: The envisaged measures for adaptation to climate change are not ensured.</p> <p>E – destructive impact: The programme does not ensure the adaptation to climate change.</p> <p>X – determination of impact is not possible: the impact cannot be determined due to the lack of data.</p>

- **Human health**

Indicator with description of criteria for categorisation in size classes for environmental objective 10: Provide people with a safe supply of wholesome drinking water in sufficient quantities

Indicator	Size classes
<p>Spatial development in water protection areas</p> <p><i>(integration of activities - infrastructure in water protection areas can have negative consequences for the quality of water)</i></p>	<p>A – no impact/positive impact: The planned spatial development does not present any pressure on water intended for drinking water supply.</p> <p>B – insignificant impact: The planned spatial</p>

	<p>development presents additional pressure on water intended for drinking water supply, although its quality will not be degraded.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development can present degradation of water quality intended for drinking water supply; mitigation measures must be considered.</p> <p>D – significant impact: The planned spatial development presents the degradation of water quality intended for drinking water supply.</p> <p>E – destructive impact: The planned spatial development presents a destructive impact on drinking water quality intended for drinking water supply; mitigation measures to reduce the impact are not possible.</p> <p>X – determination of the impact is not possible: The impact cannot be determined due to the lack of data.</p>
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**Indicator with description of criteria for categorisation in size classes for environmental objective 11:
Reduce the exposure of people to polluted air**

Indicator	Size classes
<p>Excessive pollution of ambient air</p> <p><i>(the smaller excessive ambient air pollution, the lesser the impact on human health and costs to society due to the number of exposed people whose health is affected)</i></p>	<p>A – no impact/positive impact: The planned spatial development does not increase emissions of pollutants that burden ambient air; the emission of pollutants is reduced due to the implementation of SDSS activities.</p> <p>B – insignificant impact: By implementing SDSS, the emission of pollutants increases, although it does not cause excessive ambient air pollution.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: By implementing SDSS, the emission of pollutants increases and causes excessive ambient air pollution; mitigation measures must be anticipated to reduce the impact, i.e. to ensure that the emission of pollutants will not increase in the scope that would cause excessive ambient air pollution.</p> <p>D – significant impact: By implementing SDSS, the emission of pollutants increases and causes excessive ambient air pollution.</p> <p>E – destructive impact: By implementing SDSS, the emission of pollutants increases to such an extent that can significantly and harmfully affect human health.</p> <p>X – determination of impact is not possible: the impact cannot be determined due to the lack of data.</p>

**Indicator with description of criteria for categorisation in size classes for environmental objective 12:
Reduce the exposure of people to excessive noise levels**

Indicator	Size classes
<p>Noise pollution and exposure of people to noise due to the implementation of SDSS guidelines</p> <p><i>(the less the disturbance in the environment due to noise, the less the impact on the quality of the environment, human health and the costs to society due to the number of exposed people whose health and the value of real estate is affected)</i></p>	<p>A – no impact/positive impact: The implementation of SDSS does not increase exposure of people to noise; exposure of people to noise is reduced due to the implementation of SDSS.</p> <p>B – insignificant impact: The implementation of SDSS partially increases exposure of people to noise, although the impact is insignificant.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development increases the exposure of people to noise; mitigation measures must be anticipated to reduce the impact.</p> <p>D – significant impact: The planned spatial development increases the exposure of people to noise; the impact of SDSS implementation is significant.</p> <p>E – destructive impact: The planned spatial development will increase the exposure of people to noise to such an extent that can significantly and harmfully affect human health.</p> <p>X – determination of impact is not possible: the impact of planned spatial development on the exposure of people to noise cannot be determined due to the lack of data.</p>

**Indicator with description of criteria for categorisation in size classes for environmental objective 13:
Prevent adverse effects on human health from the perspective of EMR and light pollution**

Indicator	Size classes
<p>Surface of land plots under high voltage overhead lines</p> <p><i>(The impact from EMR sources is possible due to the integration of electromagnetic radiation sources in space (especially overhead power lines, generators, transformer stations, electro motors, etc.) With remoteness from buildings, the EMR is reduced.</i></p> <p><i>The impact caused by light pollution is typical of densely populated areas due to the installation of external illumination devices on land and due to the excessive illumination of external façades of certain buildings.)</i></p>	<p>A – no impact/positive impact: New sources of electromagnetic radiation and/or light pollution are not anticipated, there will be no impact.</p> <p>B – insignificant impact: New sources of electromagnetic radiation and/or new sources of light pollution are anticipated, EMR pollution of the environment and light pollution will increase slightly, although within legally determined values.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: New sources of electromagnetic radiation and/or new sources of light pollution are anticipated; mitigation measures must be anticipated to reduce the impact.</p> <p>D – significant impact: The exposure of people to</p>

	<p>electromagnetic radiation and/or light pollution will increase; despite the consideration of legal bases, the impact can be significant.</p> <p>E – destructive impact: The exposure of people to electromagnetic radiation and/or light pollution will increase in the scope that harmfully impacts human health.</p> <p>X – determination of impact is not possible: the impact cannot be determined due to the lack of data.</p>
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- **Population and material assets**

Indicators with description of criteria for categorisation in size classes for environmental objectives 14 and 15:

- Ensure optimum distribution of activities in the space
- Ensure a good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk

Indicator	Size classes
Social welfare (access to health, income and education) <i>(better and quicker access means better social cohesion: quicker access to health, income and education can have a positive impact on the income of individuals and local communities, the individual's lifestyle and the value of material assets – real estate)</i>	<p>A – no impact/positive impact: The planned spatial development does not affect the achievement of the objective or the impact on population and material assets is positive.</p> <p>B – insignificant impact: The planned spatial development has an insignificant impact on the population and material assets.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development has a significant impact on the population and material assets; mitigation measures are possible.</p>
Development of economy and tourism <i>(development of economy and tourism means a positive impact on the individual's or local communities' income as well as the value of material assets – real estate)</i>	<p>D – significant impact: The planned spatial development has a significant impact on the population and material assets.</p> <p>D – destructive impact: The planned spatial development has a negative impact on the population and material assets.</p>
Spatial development where construction ensures the preservation of low flood risk or reduces flood risk is anticipated. <i>(greater attention is given to construction near water or coastal land and the construction on flood risk areas)</i>	<p>X – determination of impact is not possible: the impact cannot be determined due to the lack of data.</p>

- **Cultural heritage**

Indicator with description of criteria for categorisation in size classes for environmental objective 16:
Ensure comprehensive cultural heritage preservation

Indicator	Size classes
Considering spatial identity, at registered cultural heritage units, at spatial development	<p>A – no impact/positive impact: The planned spatial development does not impact the units of cultural heritage or its impact is positive.</p>

(spatial development that does not consider spatial identity can significantly endanger the integrity of cultural heritage and can change the features of cultural heritage)

B – insignificant impact: The planned spatial development has an insignificant impact on cultural heritage units; spatial development considers the legal regimes of cultural heritage conservation, therefore the impact on the features of cultural heritage is insignificant.

C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development has a significant impact on cultural heritage units; there is a possibility of not considering the features of cultural heritage units; mitigation measures for reducing negative impacts are anticipated.

D – significant impact: The planned spatial development has a significant impact on cultural heritage units, the features of cultural heritage are not considered.

D – destructive impact: The planned spatial development will have a destructive impact on the features of cultural heritage units.

X – determination of impact is not possible: the impact of implementation of SDSS on cultural heritage units cannot be determined due to the lack of data.

- **Landscape**

Indicator with description of criteria for categorisation in size classes for environmental objective 17: Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a quality landscape image

Indicator	Size classes
Considering spatial identity in areas of exceptional landscapes and landscape areas with distinctive features at the national level, at spatial development <i>(spatial development that does not consider spatial identity, can change the existing landscape and significantly endanger the integrity of exceptional landscapes and landscape areas with distinctive features at the national level, and change their features).</i>	<p>A – no impact/positive impact: The planned spatial development does not impact exceptional landscapes and landscape areas with distinctive features or its impact is positive.</p> <p>B – insignificant impact: The planned spatial development has an impact on exceptional landscapes and landscape areas with distinctive features as well as the current landscape image.</p> <p>C – the impact is insignificant due to the implementation of mitigation measures: The planned spatial development can have a significant impact on elements of exceptional landscapes and landscape areas with distinctive features at the national level and on landscape image. Mitigation measures for reducing negative impacts are anticipated.</p> <p>D – significant impact: The planned spatial development has a significant impact on elements of exceptional landscapes and landscape areas with distinctive features at the national level and on landscape image.</p>

	<p>E – destructive impact: The planned spatial development has a destructive impact on elements of exceptional landscapes and landscape areas with distinctive features at the national level. The quality landscape image will be destroyed.</p> <p>X – determination of impact is not possible: The impact of planned spatial development on exceptional landscapes and landscape areas with distinctive features at the national level, and the existing landscape image cannot be determined due to the lack of data.</p>
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5.4 ASSESSMENT OF IMPACTS ON PROTECTED AREAS

An acceptability assessment of the impacts on protected areas must be made for every plan or programme that in itself or in combination with other plans or programmes exerts adverse impacts on the integrity and functionality of Natura 2000 sites or protected areas.

The assessment of acceptability of impacts of the SDSS 2050 on protected areas (Appendix C Annex for protected areas) was prepared in accordance with regulations on nature conservation (Rules on the assessment of the acceptability of impacts caused by the execution of plans and activities affecting nature in protected areas (Official Gazette of the Republic of Slovenia [*Uradni list RS*], no. 130/04, 53/06, 38/10, 3/11)).

Natura 2000 sites encompass:

- special conservation areas determined in accordance with Directive 92/43/EEC on habitats,
- special conservation areas determined in accordance with Directive 79/409/EEC on birds,

Protected areas are state measures to conserve valuable natural values and biodiversity. There is a classification of wider (national, regional, landscape park) and narrower (strict nature reserve, nature reserve and natural monument) protected areas that are subject to regulated protection arrangements.

According to the Rules on assessing the acceptability of impacts caused by the execution of plans and activities affecting nature in protected areas (Official Gazette of the Republic of Slovenia [*Uradni list RS*], nos. 130/04, 53/06, 38/10, 03/11), the measures of the Strategy are classified under Chapter 7. in the field of transportation infrastructure of Annexes 1 and 2 to the Rules. In compliance with the aforementioned Annex to the Rules, areas of direct and long-distance impacts of transportation infrastructure facilities range up to 2,000m. The measures of the Strategy are not defined in terms of space and time. The measures on which the interventions for which an assessment in accordance with the SEA Directive is needed are based will be re-assessed, some of them at the level of operational programmes and others at the level of plans.

This Environmental Report assesses the Strategy, which is why the Appendix for the protected areas is drawn up in accordance with Article 25a of the Rules on assessing the acceptability of impacts caused by the execution of plans and activities affecting nature in protected areas (Official Gazette of the RS [*Uradni list RS*], nos. 130/04, 53/06, 38/10, 3/11): "For operational programmes and other plans or parts thereof, which are not plans in the area of spatial planning and the descriptions of which do not enable, even by way of inference, the determination of all of the planned interventions because the descriptions do not provide concrete locations of interventions or do not provide details as to the type of interventions, the matrix stipulated in Appendix 6 of these Rules shall not be completed within the scope of the acceptability assessment. In this case, expert assessments shall be provided for the individual content of these Rules, which are aimed at the preservation of a favourable status of species

and habitat types in accordance with the provision stipulated in the previous article. The matrix stipulated in Appendix 6 of these Rules shall in these cases be completed within the scope of the acceptability assessment at the level of a detailed plan or intervention."

A comprehensive assessment of acceptability for protected areas will have to be made in the later phases of preparing documentation (at the level of detailed plans or interventions) for individual infrastructural measures that could have a significant impact on protected areas.

6. OBJECTIVE COMPLIANCE ASSESSMENT

6.1 ENVIRONMENTAL OBJECTIVES INTERNAL COMPLIANCE ASSESSMENT

The selected environmental objectives must be harmonised to at least some extent, otherwise the measures for achieving a specific environmental objective can halt the achievement of another environmental objective. The internal assessment of environmental objectives compliance establishes conflicts or mutual interactions that exist between different objectives, as well as pronounced conflicts of interest of the pursued environmental objectives. If, during the verification of internal environmental objectives compliance, non-conformities are found, they must be eliminated before continuing the strategic assessment of environmental impacts.

Internal conformities of the proposed environmental objectives of SDSS 2050 have been assessed through a standard approach to matrix assessment. A colour evaluation chart was used to determine levels of compliance between environmental objectives, which is shown in the table below.

The provided compliance level assessment “connection between objectives is unclear” (yellow) means that the measures for achieving environmental objectives contribute to achieving another environmental objective positively and negatively, although impacts cannot be determined in this phase. An exact determination of impacts will be possible in the next assessment phases, when activities in the field of achieving spatial development objectives will be defined. The scope and area of interventions in the environment will be known at that time (for example: wind power plants and overhead power lines can significantly impact landscape features and individual animal species if they are integrated in the area of exceptional landscapes and the Natura 2000 area. If they are located outside of such areas, the impact can be insignificant, there is no impact or the objectives are compliant/partly compliant).

The assessment of objectives compliance is not a mandatory part of the environmental report, therefore the methodology has not been further explained and based on the subjective expert assessment of report authors.

Table 13: Evaluation chart for levels of compliance between objectives

Level of compliance	Explanation	Numerical evaluation
	The objectives are very compliant.	3
	The objectives are partly compliant.	2
	The connection between objectives is unclear.	1
	There is no connection between objectives/objectives are compliant and contradictory at the same time.	0
	The objectives are not compliant.	-1

The results of the assessment of the internal compliance of the environmental objectives in this environmental report are shown in the table below. None of the environmental objectives has been evaluated as non-compliant with any other (red). 15 connections between environmental objectives

were evaluated as “The connection between objectives is unclear.” (yellow), meaning that when there is a connection the measures for achieving a certain environmental objective also halt the achievement of another environmental objective. It has been found in our case that the set environmental objectives are reasonably compliant in pairs or partly compliant, in some cases connection is not unambiguous or there is no connection between individual objectives.

The compliance level “The connection between objectives is unclear.” (yellow) is normally found between environmental objectives that have been determined as sustainable development objectives and have been anthropogenically focused (for instance: environmental objectives for ensuring flood safety and reducing greenhouse gas emissions), and environmental objectives for the provision of a good status of the environment (for instance: environmental objectives for the provision of a good status of surface waters and the preservation of biodiversity).

If it is found in the following procedures of a comprehensive environmental impact assessment for achieving environmental and other objectives of sustainable development that due to the achievement of one environmental objective another environmental objective achievement is endangered (the connection between objectives is non-compliant – conflict), the EU environmental legislation envisages for environmental objectives of achieving a good status of waters and conservation of nature that conflict connections between measures for achieving environmental objectives are resolved according to the procedure for the dominance of public benefit over other public benefit.

This environmental report assumes that the implementation of none of the guidelines (measures) from SDSS 2050 will not cause any conflict connection in the achievement of environmental objectives.

Considering the fact that the implementation of guidelines (measures) from SDSS 2050 is described on the strategic level and more detailed implementation of guidelines (measures) is envisaged in the following phases of spatial planning, the possibility of generation of conflict connections in achieving environmental objectives is determined in this environmental report with the compliance level evaluation “The connection between objectives is unclear”, i.e. for:

- **the connection between the environmental objective of sustainable management of soil and forests (EO1)** and the objectives of providing good status of waters, conservation of nature, reduction of vulnerability for climate change and reduction of flood risk: this connection between environmental objectives is not clear, because it is not entirely obvious, whether the guidelines (measures) in SDSS regarding the achievement of the objectives of sustainable management of soil and forest suffice for achieving other mentioned environmental objectives,
- **the connection between the environmental objective of providing good status of surface waters (EO3)** and the objectives of reducing GHG emissions, reduction of vulnerability for climate change and reduction of flood risk: this connection between environmental objectives is not clear because it is not completely obvious whether the guidelines (measures) in SDSS regarding the achievement of the objectives of providing a good status of surface waters suffice for achieving other stated environmental objectives,
- **the connection between environmental objectives of nature preservation (EO6 and EO7)** and the objectives of reducing GHG emissions and flood risk reduction: this connection between environmental objectives is not clear because it is not completely obvious whether the guidelines (measures) in SDSS regarding the achievement of the objectives of the protection and conservation of biodiversity and the integrity of areas with nature protection status do not prevent or hinder the achievement of other two mentioned environmental objectives,
- **the connection between the environmental objective of reducing GHG emissions (EO8)** and the preservation of exceptional landscape: this connection between environmental objectives is not clear, because it is not completely obvious, whether the guidelines (measures) in SDSS regarding the reduction of GHG emissions do not prevent or hinder the achievement

of preservation of exceptional landscape mostly due to the integration of energy infrastructure for renewable energy sources in the space,

- **the connection between the environmental objective of reducing flood risk (EO15) and the preservation of exceptional landscape:** this connection between environmental objectives is not clear because it is not completely obvious whether the guidelines (measures) in SDSS regarding the reduction of flood risk do not prevent or hinder the achievement of preservation of exceptional landscape.

Table 14: Assessment of internal compliance of the environmental objectives

Environmental objective 1 (EO1) – sustainable management of soil and forests																		
Environmental objective 2 (EO2) – targets for annual air pollutant emission amounts																		
Environmental objective 3 (EO3) – surface waters status																		
Environmental objective 4 (EO4) – groundwater status																		
Environmental objective 5 (EO5) – marine environment status																		
Environmental objective 6 (EO6) – protect and preserve biodiversity																		
Environmental objective 7 (EO7) – integrity of areas with nature protection status																		
Environmental objective 8 (EO8) – reduce GHG emissions																		
Environmental objective 9 (EO9) – vulnerability to climate change																		
Environmental objective 10 (EO10) – drinking water supply																		
Environmental objective 11 (EO11) – exposure of people to polluted air																		
Environmental objective 12 (EO12) – exposure of people to excessive noise																		
Environmental objective 13 (EO13) – EMR and light pollution																		
Environmental objective 14 (EO14) – spatial distribution																		
Environmental objective 15 (EO15) – reduce flood risk																		
Environmental objective 16 (EO15) – preserve cultural heritage																		
Environmental objective 17 (EO17) – preserve exceptional landscape																		
	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9	EO10	EO11	EO12	EO13	EO14	EO15	EO16	EO17	

A short summary of mutual connections between environmental objectives is provided in continuation.

EO1: Ensure sustainable management of soil and forests. Sustainable management of soil and forests reduces pollutant emissions in soil and groundwater (EO4, EO10). Forests present CO₂ sink hole (EO8). Sustainable use can be achieved with optimum distribution of activities and services in the space (EO14). Forest and agricultural landscape are important elements of landscape image (EO17). Sustainable management ensures long-term preservation of the environment, but the integration of green infrastructure in sensitive areas could also have a negative impact (EO3, EO5, EO6, EO7, EO9 and EO15).

EO2: Ensure the realisation of long-term goals for annual air pollutant emission amounts. Limitation of emissions of pollutants in the air has an indirect positive impact on whole environment pollution (EO3, EO4, EO5, EO6, EO8, EO10, EO11, EO16).

EO3: Prevent deterioration of the status of surface waters and ensure the attainment of a good ecological status/potential and a good chemical status of surface waters. The good ecological and chemical status of waters has a positive impact on all parts of the environment, connected to water (EO4, EO5, EO6, EO7, EO10, EO17). Certain limitations in infrastructure construction are necessary to maintain a good ecological and chemical status of waters (EO8, EO9, EO15).

EO4: Preserve or ensure a good quantitative and chemical status of groundwater. The good quantitative and chemical status of water can be maintained by limiting emissions in the soil and waters, which can have a positive impact on nature and man (EO6, EO7, EO10).

EO5: Ensure a good status of the marine environment. The good status of the marine environment can be maintained by limiting emissions in waters, which can have a positive impact on nature (EO6, EO7, EO17) and also present some limitations in infrastructure construction (EO1).

EO6: Protect and preserve biodiversity. The protection and preservation of biodiversity is connected to reducing environment pollution (EO2, EU4, EU5, EU10, EU17), although it also presents other limitations in infrastructure construction (EO8, EU15).

EO7: Preserve the integrity of areas with nature protection status by preserving the characteristics and processes due to which they are protected. Areas with nature protection status directly help protect biodiversity (EO6) and indirectly, due to the limitation of use, can have a positive impact on other environment elements (EO3, EO4, EO5, EO17), although they also present some limitations in infrastructure construction (EO1, EO8).

EO8: Reduce greenhouse gas emissions: The reduction of greenhouse gas emissions has a direct positive impact (EO11) or indirect positive impact due to the mitigation of impacts of climate change (EO1, EO2, EO9) or the use of new technologies (EO12, EU13), although the integration of new energy infrastructure with minor GHG emissions can also have negative impact on sensitive areas (EO3, EO6, EO7, EO17).

EO9: Reduce the vulnerability of infrastructure and settlements to climate change. The measures to reduce the vulnerability of infrastructure and settlements to climate change can be used to reduce the impact of climate change on cultural heritage (EO16), although reckless integration of, for example, anti-flood and other measures can negatively impact the elements of the environment (EO1, EO3).

EO10: Provide people with a safe supply of wholesome drinking water in sufficient quantities. The objective is directly connected with providing clean surface and groundwater (EO3, EO4) and

indirectly also with other objectives that ensure the reduction of environment pollution (EO1, EO2, EO6, EO11, EO14, EO15).

EO11: Reduce the exposure of people to polluted air. The objective is directly connected with objectives limiting emissions in the air (EO2, EO8I and consequently positively impacts other objectives, connected with pollution reduction (EO10).

EO12: Reduce the exposure of people to excessive noise levels. Besides anti-noise measures and new technologies (EO8) appropriate spatial planning (EO14) is also required for realising this objective.

EO13: Prevent adverse effects on human health from the perspective of electromagnetic radiation and light pollution. The realisation of this objective especially requires appropriate spatial planning (EO14).

EO14: Ensure optimum distribution of activities in space. Appropriate spatial planning represents the basis for achieving all environmental objectives.

EO15: Ensure a good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk. Reckless integration of anti-flood measures can negatively impact environmental elements (EO1, EO3, EO6, EO17), while appropriately implemented anti-flood measures can prevent the pollution of groundwater or the sea and protect cultural heritage (EO4, EO5, EO10, EO16).

EO16: Ensure comprehensive cultural heritage preservation. The preservation of cultural heritage by itself has no impact on the preservation of other environmental elements, while environment preservation can indirectly impact the preservation of cultural heritage due to the reduction of pollution, the reduction of climate change effects or the reduction of flood effects (EO2, EO9, EO14, EO15).

EO17: Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level, and a quality landscape image. The preservation of landscape is possible only with the preservation of natural environment (EO1, EO3, EO5, EO6, EO7, EO14) and cultural heritage (EO16), which can also present some limitations in infrastructure construction (EO8, EO15).

6.2 EVALUATION OF COMPLIANCE OF SDSS 2050 OBJECTIVES AND ENVIRONMENTAL OBJECTIVES

Within the scope of a comprehensive evaluation of SDSS 2050 impacts on the environment, the evaluation of the so-called “external compliance” of spatial policy objectives, determined in SDSS 2050, with environmental policies objectives was prepared to identify the cross-sectional contents – with regard to synergy and potential conflict. Such an evaluation of external compliance of SDSS 2050 objectives is used to establish the scope and type of connections between planned implementation of spatial policy and the adopted environmental policies.

External compliance of SDSS objectives has been evaluated at the level of all 5 general objectives of the planned spatial policy and key environmental objectives, that were determined in this environmental report as relevant for the assessment of environmental impacts that will emerge due to the implementation of guidelines (measures) for achieving spatial objectives.

External compliance of SDSS 2050 objectives has been assessed with regard to the selected environmental objectives of this comprehensive environmental impact assessment through a standard approach to matrix assessment. A colour evaluation chart was used to determine levels of compliance between SDSS 2050 objectives, which is shown in the table below.

The assessment of objectives compliance is not a mandatory part of the environmental report; therefore the methodology has not been further explained and based on subjective expert assessment of report authors.

Table 15: Evaluation chart for levels of compliance between objectives

Level of compliance	Explanation	Numerical evaluation
	The objectives are very compliant.	3
	The objectives are partly compliant.	2
	The connection between objectives is unclear.	1
	There is no connection between objectives/objectives are compliant and contradictory at the same time.	0
	The objectives are not compliant.	-1

With consideration of environmental objectives of all 85 possible compliance evaluations, in general, the SDSS 2050 objectives were:

- very compliant 49 times,
- partly compliant 12 times,
- the connection between objectives was unclear 6 times and
- there was no connection between objectives 18 times.

To achieve the SDSS 2050 objectives, where the level of compliance with individual environmental objectives was evaluated “the connection between objectives was unclear” (yellow), there is a possibility for significant impacts on the environment which can be mitigated by considering the conditions that are still acceptable to the environment and there is also a possibility of significant negative impacts on the environment that cannot be mitigated. The SDSS 2050 objectives are categorised in this compliance group, which can be achieved by integrating new infrastructure and functional connections in the environment, which are required for spatial development.

The results of the compliance assessment of the SDSS 2050 with environmental objectives indicate:

- the SDSS 2050 objectives are compliant with those environmental objectives that have been defined on the EU level as Slovenia’s contribution to achieving each specific objective,
- none of the SDSS 2050 objectives are compliant with any of the selected environmental objectives,
- all SDSS 2050 objectives are compliant or partly compliant with at least three (3) selected environmental objectives, thus ensuring the sustainable orientation of Slovenia’s spatial development,
- the SDSS 2050 that require new construction measures are very likely to have negative environmental impacts, especially from the aspect of habitat fragmentation, the current status of the aquatic environment and human health (air pollution, flood risk) whose consequences may be prevented or mitigated by suitable mitigation measures.

The relations between SDSS 2050 objectives and environmental policies objectives have been further analysed in this environmental report on the basis of the assessment of impacts of planned guidelines (measures) implementation for achieving the SDSS 2050 objectives. This applies especially to conflict relations arising from potentially negative impacts of spatial development (as envisaged by the SDSS

2050 and all its guidelines) on the environment, which are further described in Section 7 of this environmental report. Section 7 also proposes mitigation measures that can transform any conflict relations that are acceptable for the environment or are even considered to be synergy relations

Table 76: Evaluation of compliance of SDSS 2050 objectives and environmental objectives

SDSS 2050 objectives/environmental objectives	Soil	Air	Water			Nature		Climate factors		Human health			Population and material assets		Cultural heritage	Landscape	
	EO1	EO2	EO3	EO4	EO5	EO6	EO7	EO8	EO9	EO10	EO11	EO12	EO13	EO14	EO15	EO16	EO17
1	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	Green	Green	Light Green	Green	Light Green	Light Green	Green	Green	Light Green	Light Green
2	Light Green	Green	Light Green	Light Green	Green	Light Green	Light Green	Green	Yellow	Green	Green	Yellow	Light Green	Green	Green	Green	Light Green
3	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
4	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Grey	Grey	Green	Green	Green	Green
5	Grey	Grey	Grey	Grey	Green	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey

KEY:

EO – environmental objective

Objectives of SDSS 2050:

1. Strategic objective 1: A rational and effective spatial development
2. Strategic objective 2: Competitiveness (and attractiveness) of Slovenian cities
3. Strategic objective 3: High-quality life in urban and rural areas
4. Strategic objective 4: Enhance spatial identity and multi-functionality of space
5. Strategic objective 5: Resistance of space and adaptability to change

7. THE ASSESSMENT OF IMPACT OF SDSS 2050 IMPLEMENTATION ON ENVIRONMENTAL OBJECTIVES, MITIGATION MEASURES AND STATUS MONITORING

7.1 THE ASSESSMENT OF SDSS 2050 CONCEPT AND OBJECTIVES ON ENVIRONMENTAL OBJECTIVES

Slovenia's spatial development concept is part of the SDSS 2050 and represents a strategic framework for connecting spatial systems and structures, used to realise spatial development objectives (MOP, 2019). The concept follows the principles of polycentric development and rational organisation of spatial activities on Slovenia's territory and is due to the regional integration of Slovenia conditioned in many ways by previous spatial development.

On the basis of the vision and objectives of spatial development 2050, the projections of development and starting points in key strategic documents, two versions of the spatial development model (A and B) were prepared initially, enabling the completion of SDSS 2050 objectives and they responded to the challenges of spatial development, although with different spatial solutions. The key differences were in the distribution, quality, and accessibility of services, the method of their assurance, required funds, space, natural resources, impacts on traffic flows and linked consequences as well as impacts on the natural environment. Through a wide discussion on the advantages and weaknesses of both models, the valuation of A and B models from the aspect of realising the objectives and challenges of SDSS 2050, the evaluation of Slovenia's spatial development model from SDSS 2004 and status model, model C was the starting point and framework for SDSS 2050. The model or concept³³ of Slovenia's spatial development is based on a polycentric urban system concept, which contributes to rational and effective spatial development. Polycentric urban development can contribute to the quality of living in cities and creates attractive, vital and reproduction cities and reduces the trend of emigrating to the periphery and suburbanisation. This reduces the pressure of construction and mobility to the scope and quality of sources, as well as enables greater regulation of spatial structure (Faculty of Biotechnology, 2018).

The comprehensive approach to spatial development in SDSS 2050 strives to connect sectors and various levels (horizontally and vertically) and strives to design long-term measures to ensure the increase of spatial cohesion between three main spatial domains that are quite contradictory in their essence: physical (P), including environment, socio-cultural (S) and economic (E). These are the integral pillars of spatial development; therefore, SDSS must contribute to equal progress of all three in a cohesive manner and eliminate all inherited structural disproportions in space. The adoption of spatial cohesion concept for Slovenia's spatial development by 2050 demands the introduction of a new intervention logic of spatial development that is based on searching and using cross-sectional interest in space (Biotechnical Faculty, 2019). Because the spatial development concept is founded on the simultaneous, synergy, integral and mutually co-dependent development of three spatial systems, where social, economic and environmental aspects of development are considered, it is not rational to assess the SDSS 2050 effects only on the environment. From this aspect, the assessment of SDSS effects on the environment was implemented as part of the strategic evaluation which:

- provided the evaluation of compliance of guidelines and measures of SDSS with SDSS 2050 objectives to provide the evaluation of SDSS effect from the aspect of contribution to spatial cohesion,

³³ ZUreP-2 (Article 66) determines spatial development model as long-term spatial development concept.

- provided the assessment of compliance of line policies objectives and objectives determined in the SDSS 2050 or provided the assessment of their mutual connection, and
- provided the assessment of internal compliance (consistency and coherence) of SDSS 2050, i.e. the compliance between the starting points of SDSS 2050 and SDSS 2050 objectives.

In continuation, we are summarising the methodology and key findings of the report on Strategic Evaluation of SDSS 2050 – Final Report (Biotechnical Faculty, 2019).

The cohesive potential of SDSS effects and the way SDS change key negative trends in space, found on the basis of preliminary situation analyses, were verified within strategic evaluation. The second purpose of the evaluation was to prepare sample evaluation as the basis for designing instructions to evaluate cohesive impacts of environmental measures in the future in the preparation and implementation of SDSS 2050 measures and for the evaluation of cohesive impacts of non-spatial measures or measures of other line ministries in the adoption of their policies.

The cross-section method, based on matrix evaluation procedure, was the basis tool used for strategic evaluation and it differs between direct and indirect impacts, thus enabling the establishment of synergies and cohesion. The evaluation procedure comprises three steps and starts with the Leopold matrix for evaluating the effects of SDSS measures on SDSS indicators for each of the three spatial domains. Direct effects of measures of a certain domain on the indicators of the domain were evaluated on diagonal cross-sectional areas (PP, EE and SS). These are the classic performance indicators of SDSS. Collateral or indirect effects of SDSS are indicated on non-diagonal areas, whereas the measures of one domain have effects on the indicators of other two spatial domains. The matrix was completed expertly according to the method of majority imposition in a group of eight highly qualified and well informed people.

Table 17: Effects of measures on indicators – Leopold matrix (source: Strategic Evaluation of SDSS 2050, Biotechnical Faculty, 2019)

SDSS indicators*		1	2	3	4	5	6	7	8	9	10	11	12
SDSS measures	Spatial domain	P					E			S			
1	P	++	+	++	++	++	+	+	++	+	++	++	++
2		++	++	++	++	++	+	+	++	++	++	++	++
3		++	++	++	++	++	++	n/r	++	++	n/r	++	0
4		n/r	n/r	n/r	n/r	++	+	n/r	+	+	+	+	+
5		++	+	+	++	++	n/r	n/r	+	+	n/r	n/r	n/r
6	E	++	++	++	++	++	++	++	++	++	++	++	++
7		+	+	+	++	++	++	++	++	++	++	++	+
8		++	++	++	++	++	++	++	++	++	++	++	++
9		++	++	++	++	++	++	++	++	++	++	++	++
10	S	+	0	+	+	++	-	n/r	n/r	+	++	++	n/r
11		++	++	++	++	++	+	+	++	++	++	++	++
12		++	++	++	++	++	+	+	++	++	++	++	++

*Scale of impact evaluation:

- ++ The measure has a strong and positive effect on achieving the target indicator value
- +
- +
- +
- 0 No effect
- The effect is low to moderately negative
- The measure strongly hinders the achievement of the indicator's target value
- n/r Not relevant, because there is no direct connection between the measure and the indicator

The acquired evaluations of individual effects are in the second step of the matrix procedure for the synergy evaluation or SDSS cohesiveness assessment aggregated by type and area of impact in the quadrant input-output matrix of impacts between three spatial domains. The matrix shows the relations between spatial integration domains introduced by the SDSS or how strongly these relations are connected or contradictory.

Table 18: The effect of SDSS measures on three spatial domains – input/output matrix (source: Strategic Evaluation of SDSS 2050, Biotechnical Faculty, 2019)

Indicators SDSS	P	E	S
SDSS measures			
P	5 excellent	4 very good	4 very good
E	5 excellent	5 excellent	5 excellent
S	5 excellent	3 good	5 excellent

The results of SDSS 2050 effects evaluations on the basis of expert grades have shown that direct effects of SDSS (PP, EE, SS) on spatial domains (and consequently on the environment) are evaluated excellently, meaning that the SDSS considers sectoral interests entirely. However, a high level of balance between spatial domains as pillars of spatial development does not suffice for high spatial cohesion until the cross-sections between spatial domains are achieved (cross-sectionality, Si-spatial identity, Sq-spatial quality and Se-spatial efficiency). The relations between indirect effects, shown in the correlation matrix (Table 19) with the correlation of non-diagonal symmetrically positioned fields of input/output matrix are of key importance to study the cohesiveness of SDSS.

Table 19: Cross-sectional evaluation – Correlation matrix (source: Strategic Evaluation of SDSS 2050, Biotechnical Faculty, 2019)

	P	E	S
P	5, excellent	(Si = grade 4 + grade 5 = Very strong cross-section (grade 5, excellent) and minor imbalance to the detriment of E (grade 4, very good))	(Sq = 4 + 5). Very strong cross-section (grade 5 = excellent) and minor imbalance to the detriment of S (grade 4, very good)
E	-	5, excellent	(Si = 5 + 3). Very strong cross-section (grade 4, very good) and moderate imbalance to the detriment of E (grade 3, good)
S	-	-	5, excellent

The scale of evaluating all three spatial cohesion components (Si, Se, Sq):

- **Cross-section strength grades:** excellent grade (5), if both cross-section grades are excellent; very good grade (4), if the sum of cross-section grades is at least 8; good grade (3), if the sum of grades is at least 6; sufficient (2), if the sum of grades is at least 4; otherwise, the grade is insufficient (1).
- **Weak balance grade (in the cross-section of spatial domains):** excellent grade (5) if the grades for both cross-sections are the same; very good grade (4), if the achieved grades are lower than the nearest balance for 1 point (e.g. if the grade of cross-sections is 4 and 5, the nearest balance is 4.4 or 5.5 and deviation is 1 point); good grade (3), if the difference to the nearest balance is 2 points; sufficient grade (2), the difference to the nearest balance is 3 points; insufficient grade (1), if the difference to the nearest balance is 4 points.

The evaluations of SDSS impacts on all three spatial domains are equally excellent, which can be seen from the comparison of three diagonal values of correlation matrix, therefore, the evaluation of SDSS contribution to achieving strong balance between spatial domains is the best possible grade. The strength of indirect connections between domains as expressed by synergies among them, are graded excellently for Sq and Su and very good for Si. The contribution of SDSS to spatial cohesion is therefore very good. The worst, but still rather high, are the grades for weak balance in the nature of synergies between spatial domains: very good for Sq and Su and good for Si. Therefore, the contribution of SDSS to spatial cohesion is evaluated as being very good.

The results of the evaluation SDSS impacts were compared with demands set by the initial situations evaluated in preliminary analyses of tendencies in space, which is dictated by the order of priorities. The assessment evaluates whether the SDSS introduces measures with impacts that are inversely proportional with initial disproportions – therefore, they are most in favour to the weakest components

of spatial integration. Regardless of the preliminary analyses, the need for improving the socio-cultural spatial domain (S) followed by the economic (E) domain was shown. SDSS promises positive benefits for all three spatial domains, meaning that the structural situation S (primarily as the weakest link of spatial development) will remain weaker than P and E. Therefore, total structural evaluation of SDSS 2050 impacts regarding the initial spatial balances is only good (3). The evaluation of the structural contribution of SDSS to spatial cohesion components is even worse, i.e. sufficient (2), because there are tendencies of increasing primary structural non-compliances.

External compliance or the compliance of sectoral policies from the aspect of spatial cohesion objectives was assessed within the strategic evaluation. External compliance was evaluated with the Leopold matrix on the level of policy objectives: 5 general SDSS 2050 objectives and the objectives of key areas (sectoral policies) are defined in strategic documents. In continuation, we are summarising the results of the compliance assessment by individual areas (Strategic Evaluation of SDSS 2030/2050 – Interim Report, BF, June 2017).

Social infrastructure and settlement (apartments, health care, education, cultural heritage protection)

The matrix of compliance of social infrastructure and settlement objectives shows that the objectives in the field of apartments, health care, education and cultural heritage protection are mostly compliant with SDSS 2050 objectives. There are no non-compliant objectives. D1 objectives is completely compliant with all SDSS 2050 objectives: Quality architecture and balanced offer of suitable apartments, other objectives (D2: Easier access to quality and functional apartments; D3: Development of quality art and cultural creativity in Slovenian language and increasing accessibility to quality cultural contents; D4: Quality preserved and modernly presented cultural heritage for a larger number of visitors and greater recognition of heritage; D5: accessible, successful and stable system of health care, which adjusts effectively to the needs of the citizens; D6: Reduced problems of injuries, chronic diseases and obesity through a safe environment, physical activity and healthy nutrition) are mostly compliant or neutral with one or mostly two objectives of the social component.

Economic and regional development (EU cohesion policy, technology, communications, tourism)

10 objectives in economic and regional development were assessed in relation to 5 SDSS 2050 objectives. The Leopold matrix of compliance showed that the objectives in economic and regional development are mostly compliant with SDSS objectives. From 50 possible assessed combinations, 3 were assessed as non-compliant (-), 1 as non-compliant and compliant at the same time (+/-), 6 were assessed as non-related (o), other combinations were assessed as compliant (+).

- The following objectives were assessed as non-compliant with SDSS objectives; C4: Ensuring Slovenia's spatial identity, G2: Ensuring the adaptation to climate change and transition to low-carbon society and the prevention and risk management, G3: Strengthening research, technological development and innovation, transition to digital society, and G5: Development of sustainable transport.

It was evaluated that adaptation to climate change and transition to low-carbon economy can significantly impact Slovenia's spatial identity mostly by establishing the infrastructure for acquiring and using wind and solar power plants and through a modified image of buildings due to energy efficiency measures. It was also evaluated that the G3 objective can significantly impact Slovenia's image, mostly by using new technologies in agriculture and the energy sector. The G5 objective can significantly impact the assurance of Slovenia's spatial identity by building transport ways and corridors (roads, railways, airports).

- G6 objective: Sustainable tourism and an increase in the quality and the scope of tourist activity was as the only factor among all of the evaluated objectives assessed as compliant and non-compliant at the same time (+/-) also in relation to the SDSS objective C4.

Sustainable tourism can contribute to "protecting" attractive landscapes and preserving spatial identity, although there is a possibility that excessive increase of tourist and hospitality activities can negatively impact the assurance of Slovenia's spatial identity (construction of new facilities, developmental pressure on landscapes interesting for tourism).

- G4 objective: Strengthening the international and local competitiveness of the economy and ensuring a positive business environment, G8: Promoting social security and inclusion as well as fighting poverty and discrimination; G9: Flexible life-long education and training, creating competitive human resources, and G10: Improving the functioning of the legal state, public institutions and administration was assessed as neutral with the SDSS objective C4 because there is no content co-relation with ensuring Slovenia's spatial identity.
- Other assessed objectives, where there were no interactions, included the G9 objective in relation to SDSS objective C1: Rational and effective spatial development and G6 objective in relation to SDSS objective C5: Flexibility/resilience and adaptability to changed situations.

Environment (air, climate change, water usage and management, nature preservation)

The matrix of compliance of objectives in environment with the SDSS 2050 objectives shows that objectives are mostly compliant. Strong non-compliance was noticed with O6 objective: The preservation of integrity of areas with nature protection status by preserving the characteristics and processes due to which they are protected, which is not compliant with SDSS objectives C1: A rational and effective spatial development and C2: Greater competitiveness of Slovenian cities. The preservation or achievement of a beneficial state of endangered species and habitat types is, due to the large spatial scope and strict protection regimes, aggravating the development of necessary infrastructural systems and thus hinders rational spatial development. Ensuring the O6 objective further hinders the development and competitiveness of cities. The following environmental objectives are completely compliant with all SDSS 2050 objectives: O1: Guaranteeing the rational and efficient use of natural resources, O2: Ensuring the achievement of long-term goals for annual air pollutant emission amounts and the reduction of GHG emissions, O3: Provision of good ecological and chemical status of surface waters and good quantitative and chemical status of groundwater, O4: Protection of drinking water against pollution, O5: Protection and preservation of a high level of biodiversity, O8: Reduction of exposure of people to polluted air and excessive noise, the prevention of harmful effects on human health from the aspect of EMR load, O9: Ensuring optimum distribution of activities and services in space, and O11: Preservation of natural assets and preventing the reduction of biodiversity, preservation of natural balance in ecologically important areas (EIA).

Traffic and sustainable mobility (road, rail, marine, air traffic)

The matrix of objective compliance in traffic and sustainable mobility with SDSS 2050 objectives shows complete compliance of objectives.

Agriculture, forestry, hunting and fishing

8 objectives were assessed in relation to 5 SDSS 2050 objectives. The compliance matrix showed that the objectives in agriculture, forestry and fishing are mostly compliant with SDSS 2050 objectives. Only 1 combination out of 40 assessed combinations was non-compliant (-), 4 of them were assessed as having no content connections (o). Other assessed combinations were evaluated as compliant (+).

- Objective K5: Facilitating the transfer of knowledge and innovation in agriculture, forestry, fishing and aquaculture and in rural areas, and objective K7: Enhancing employment and social inclusion in coastal and continental fishing communities were evaluated as not being related to SDSS objective C4: Ensuring Slovenia's spatial identity,
- the only contradictory relation between objectives was evaluated for the relation between SDSS objective C4 and the K2 objective: Promoting agricultural, food, forestry and the fishing sector in the transition to low-carbon economy, resilient to climate change.

The transition of agriculture, food and fishing industry to new technologies can significantly impact Slovenia's spatial identity (new methods of soil processing, "physical" protection of fields against the weather).

- There are also no connections between SDSS objectives C1: Rational and efficient spatial development and K5. There are also no content connections between SDSS objective C5: Flexibility/resilience and adaptability to changed situations and K7 objective.

Energy and mining

8 objectives were assessed in relation to 5 SDSS objectives. The Leopold matrix of compliance showed that the objectives in energy and mining are mostly compliant with SDSS objectives. ¼ of combinations of objectives of 40 assessed combinations were evaluated as non-compliant (0) or partly compliant and contradictory at the same time (+/-). Among all 5 SDSS objectives in energy and mining, the following are completely non-compliant (5 of 8 objectives) with the SDSS objective C4: Ensuring Slovenia's spatial identity.

- The following objectives were non-compliant with SDSS objective C4 – E1: Almost carbon-free energy use in buildings by 2050 and the reduction of GHG emissions and particulates in buildings, E3: Improving Slovenia's energy efficiency by 2020, so that the use of primary energy in 2020 will not exceed 7.125 mio tonnes (82.86 TWh), E4: 25% of gross final energy from RES by 2020.

Energy restoration of buildings, production and use of RES (setting up infrastructure, e.g. solar and wind power plants) can significantly impact the image of architectural facilities, the image of cities and rural settlements.

- E7 objective: The use of domestic mineral raw materials for the needs of natural and cultural heritage as well as other special purposes, including the preservation of mining, which is part of landscape, was evaluated as compliant and contradictory at the same time with C4 objective.

The use of domestic mineral raw materials can positively and negatively impact Slovenia's spatial identity. The use of local materials in architecture, the preservation of mining as part of landscape is understood as positive, while the expansion of local quarries could have negative impacts on landscape.

- With the SDSS objective C1: Rational and effective spatial development is non-compliant with objective E5: Ensured a reliable and quality supply of electric power and E6: Competitive ability of the mineral raw materials sector and a balanced supply of mineral raw materials from domestic sources.

The construction of new parts of the electric network for ensuring electric power can significantly impact rational and efficient spatial development (e.g. determination of suitable land, integration of infrastructure in space, conflicts between various usages and activities in space). By opening and expanding existing quarries, the increase or preservation of competitive ability of the mineral raw materials sector can significantly impact spatial development.

- E7 objective was, the same as C4 objective, evaluated as compliant and contradictory to C1 objective.

The use of domestic raw materials can contribute to quality use of local sources, while the expansion of quarries could be detrimental for space.

- The E6 objective: The quality of life in cities and the countryside is at the same time compliant and non-compliant with the SDSS objective C3.

The competitiveness of the mineral raw materials sector has beneficial impacts on the quality of life in cities and the countryside because the use of local resources enables income and work in the local environment, where such activities are present. On the other hand, the expansion or opening of new quarries can bring more degraded surfaces, noise, transportation and material deposit sites, thus leading to the reduction of quality of life of the people living in this environment.

Detailed assessment of external compliance or the compliance of sectoral policies from the aspect of spatial cohesion objectives is evident from Appendix 4 of the Strategic Evaluation of SDSS 2050 Interim Report (BF, June 2017).

The impact of SDSS 2050 objectives on environmental objectives

The results of strategic assessment of external compliance of compliance of SDSS 2050 objectives with the environmental policy objectives are presented on page 146. Spatial development objectives

have no direct environmental effects. Potential (indirect) negative environmental effects could be caused by two objectives:

- C1: Rational and efficient spatial development that strives for rational organisation of activities in space and the equipment of centres as well as accessibility, effective use of spatial potentials while taking into account the limitations of space, and cohesion between all parts of Slovenia.

The objective can also impact EO7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected because the development of necessary infrastructural systems hinders the preservation of their integrity and hinders the achievement of good status of endangered species and habitat types due to the great spatial scope of areas with nature protection status.

- C2: The competitiveness of Slovenian cities that strives to strengthen cities, their integration in international flows and to promoting functional connection within wider city areas and other areas of functional connection as well as the countryside.

C2 objective can also impact EO7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected because the development and the connection of wider city areas and other areas of functional connection and the countryside hinders the preservation of their integrity and hinders the achievement of a good status of endangered species and habitat types.

Despite this the potential negative environmental effects of SDSS 2050 objectives are not significant by themselves or by considering mitigation measures, determined in the assessment of SDSS 2050 guidelines on environmental objectives.

The impact of SDSS 2050 concept on environmental objectives

The concept itself does not impact the achievement of environmental objectives, although it can present one of the alternatives of the framework for connecting spatial systems and structures, which, due to the achievement of the SDSS 2050 objectives, cause various impacts on the environment. Due to the strong traces of past spatial development on Slovenia's territory and a relatively small spatial framework of Slovenia, which is strongly integrated in neighbouring regional systems and structures, it is hard to imagine that SDSS 2050 would be designed on alternatives with regard to the spatial development concept. An even more difficult task would be to prepare the assessment of environmental impacts of individual alternatives and to compare those assessments.

The environmental aspect is not and cannot be of key importance for determining the spatial development concept; the socio-cultural and economic aspects are the decisive factors. By using the guidelines to realise the concept in the environmental report, the environmental effects are merely verified and mitigated by proposing additional (mitigation) measures.

The key elements of SDSS, which are subject to a comprehensive assessment of environmental impacts, are the guidelines (measures) to achieve objectives. The long-term SDSS 2050 objectives and guidelines to achieve them refer to promoting polycentric and balanced territorial development and are harmonised with the objectives and guidelines as determined in the Territorial Agenda of the European Community 2020 (TA2020) for strategic acts of Member States in territorial cohesion. The task of a comprehensive assessment of environmental impacts is to assess the compliance of planned objectives with environmental objectives, which have been harmonised and adopted at the EU level or integrated in international contracts, and to assess the impacts of guidelines (measures) that are necessary to achieve planned objectives on the achievement of environmental plans. A comprehensive assessment of the impacts of SDSS 2050 guidelines by individual areas of the environment is presented in continuation.

7.2 A COMPREHENSIVE ASSESSMENT OF IMPACTS OF SDSS 2050 GUIDELINES BY INDIVIDUAL AREAS OF THE ENVIRONMENT

Section 7.1 presents the assessment of SDSS guidelines on individual environmental aspects and important environmental objectives. This section also provides mitigation measures and indicators to monitor the situation, provided that they are required. Evaluations of consequences of the implementation of SDSS guidelines on the realisation of environmental objectives are shown in the table in section 6.2.

SDSS 2050 is a strategic document and not a plan, from which all planned interventions could be evident, because the descriptions do not contain concrete locations of interventions and detailed type of interventions are not evident from them. A detailed assessment of impacts will therefore be carried out at the level of a detailed plan or intervention.

7.2.1 NATURAL RESOURCES: LAND AND FOREST

Environmental objective 1: Ensure sustainable management of soil and forests
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Set 1 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines will impact sustainable soil management:

- settlements are planned primarily through renovation and internal development within the area of existing settlements, reducing the share and size of degraded areas;
- further expansion of individual settlements is prevented, only existing individual settlements that comprise less than ten residential buildings are preserved (outside of endangered areas);
- within the units of individual settlement in the countryside, the existing dwelling stock may exceptionally be complemented through new construction projects, taking into consideration the guidelines for the recognisability of settlements and the landscape and the protection of nature and resources, provided that these projects are performed within the scope of modernising the existing activities;
- withdrawing settlements and infrastructure from endangered areas and preserving and establishing overflow areas;
- establishing natural safeguards against extreme events and heat islands with more well-maintained green areas as elements of the green infrastructure, the green system of regions and towns;
- priority provision of areas for residential buildings by restoring degraded areas or existing low-density residential areas, while providing sufficient open public built-up and green areas;
- priority siting of economic and business zones in abandoned industrial, municipal, transport and similar degraded areas or in existing economic and business zones;
- priority siting of new shopping centres in degraded areas in urban settlements or on land which may be used for this purpose within the internal development of settlements as part of functional reorganisation or urban renovation of settlements or their sections;
- preventing the changing of open public built-up surface and green surfaces into surfaces for parking vehicles;

- areas earmarked for long-term development must not increase the vulnerability of space in the wider area of a settlement, i.e. they must not degrade flood safety or affect natural overflow areas or other areas of potential natural disasters.

The description of impacts on ensuring sustainable soil management: soil is an important non-renewable natural resource, which degrades very quickly while the generation and regeneration of soil is extremely slow. Soil provides many functions and tasks that are significant for human activities and the survival of ecosystem. These functions include the production of biomass, storage, filtering and transformation of nutrients and water, soil is the source of biodiversity, the foundation of most human activities, the storage of carbon and also the archive of geological and archaeological heritage. Soil degradation or the improvement of soil have a significant effect on other areas of environment protection, such as the protection of surface waters and groundwater, human health, climate change, nature protection, biodiversity and the safety of food.

Soil is a natural resource that is under increasing environmental pressure and as such has to be protected against degradation. EU has determined eight main soil degradation processes. These include erosion, reduction in the quantity of organic matter, pollution, salting, compaction of soil, reduction of biodiversity of soil, construction, land slumps and floods. The considered impacts of SDSS 2050 guidelines refer to soil degradation caused by construction.

To preserve all soil function, the use of soil must be implemented sustainably, preserving the abilities to carry out ecological, economic and social services, as well as their functions so that future generations will be able to satisfy their needs. Guidelines for achieving the environmental objective “ensuring rational and effective land use” are based on measures to preserve the function of soil, the measures to prevent land degradation and to mitigate the effects of land degradation and the measures to rehabilitate degraded land.

Although neither Slovenian nor the Community’s legislation do not determine the criteria to define the level of land degradation, there are also no verified registers for Slovenia about land plots with degraded land, it is considered in accordance with SDSS 2050 guidelines that all developed land is considered to be degraded land. Such SDSS 2050 standpoint is harmonised with the standpoints of the Community’s environmental policy³⁴. The considered SDSS 2050 guidelines in accordance with the environmental objective of “guaranteed rational and effective land use” direct spatial development by priorities to the areas of the existing settlements so that the expansion of populated areas is prevented to the maximum extent and that settlement is withdrawn from areas, endangered due to floods and landslides, where additional degradation of land could be caused due to natural disasters.

Since certain sectoral developmental programmes cause additional degradation of land or mitigate it, due to the lack of environmental legislation in the area of land protection, the aspects of land protection against degradation must be integrated in those sectoral developmental programmes via guidelines for their spatial development as is envisaged in the SDSS 2050 guidelines.

Due to certain sectoral developmental programmes, construction is notably increasing as a consequence of the expansion of settlement areas and enhanced need for land. SDSS 2050 guidelines are considered to be appropriate measures that will restrict construction on land by restoring abandoned areas or with the densification of settlement in areas of existing settlement, which will limit the disappearance of green areas.

The description of impacts on ensuring sustainable forest management: the guidelines for regulation and development of settlements have no direct impact on ensuring sustainable forest management, although it can have an indirect positive impact.

³⁴ Decision no. 1600/2002/EC of the European Parliament and of the Council as of 22 July 2002 on the sixth environmental action programme of the Community.

The impact of guidelines for regulation and development of settlements on ensuring sustainable land and forest management is positive (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The following guidelines will impact the environmental objective:

- the development of urban settlements according to the multi-functionality principles and complementarity principle, whereas mixed use is promoted and exclusive use of space is limited, although an appropriate proportion in the use of land and buildings is guaranteed,
- providing a sufficient scope of open public built-up and green surfaces during renovations and expansions of urban settlements;
- the priority provision of residential areas, areas for social infrastructure, and areas for the needs of the economy by renovating existing degraded areas that have already undergone urban planning, without endangering the quality of the living environment.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of guidelines for planning and developing settlements apply to the descriptions and impact assessments of guidelines for urban development on the provision of sustainable land and forest management. Guidelines for urban development contribute to sustainable land and forest management.

Guidelines for urban development have a positive impact on the provision of sustainable land and forest management (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines will impact the environmental objective:

- priority development of activities that are founded on *sustainable use of natural resources* and do not require a large accompanying infrastructure;
- long-term withdrawal of settlement from endangered areas (areas with major and moderate flood risk, areas with landslides);
- searching for spatial capacities for developing agricultural holdings within existing rural settlements and villages;
- integrating large agricultural and production plants to production activities' areas or outside dense settlements;
- the use of degraded land in settlements or environmentally degraded areas for agricultural production, where the method of production is not directly connected to agricultural land;
- priority preservation of agricultural land that is of strategic importance for the state due to its production potential, scope, complexity and long-term preservation of their sustainable fertility for food production and landscape preservation;
- guiding agriculture towards organic farming in environmentally sensitive and protected areas and in the vicinity of settlements;
- preventing overgrowing and preserving productivity to limit the reduction of the scope of agricultural land;
- preserving parts of forest land on flat areas;
- harmonising agricultural activities with a potential multi-functional role of agricultural areas in the green system of a region and settlement;
- priority preservation of forest land on flat areas and including forests in green systems of regions and cities;
- *preserving continuous forest complexes* for protecting exposed hillsides or in endangered areas;
- planning new development of activities in areas where appropriate supply of users with drinking water is possible without major spatial interventions;

- reducing the number of surface mineral raw materials excavation sites, gradual closure of minor facilities and rehabilitation of illegal excavation sites;
- opening new facilities to acquire mineral raw materials only in cases where there are increased needs in the state, which cannot be satisfied with open buildings in the area of economic transport remoteness or the use of recycled secondary resources;
- exploiting rare and unique mineral raw materials in protected areas in certain locations is permissible only if such exploitation is in the form of occasional mining intended for *renovating cultural heritage*.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of guidelines for planning and developing settlements apply to the descriptions and impact assessments of guidelines for rural development on the provision of sustainable land and forest management. Guidelines for rural development contribute to sustainable land and forest management.

It must be emphasised in connection to impacts on sustainable forest management that the society has an increasing need for forests. Forests cover major parts of the countryside and are exceptionally important for rural population because they support economic welfare and create jobs. Sustainable, trained and safe labour force is one of the pillars of competitive forest sector. Well-managed forests with trained managers, workers and entrepreneurs lead the way to a sustainable and competitive forest sector that has an important role in the development of the countryside and the entire economy, at the same time it ensures social benefits, rational and effective use of land.

The guidelines for rural development present the opportunities for the development of sustainable forest management, because they ensure or enable:

- the priority to investments in the modernisation of forestry technologies,
- the optimisation of forestry sector's contribution to green economy,
- the improvement of flexibility and increase of environmental value and mitigation abilities of forest ecosystems,
- attaining the objectives for nature and biodiversity,
- climate change adaptation,
- preservation of forest green sources and
- the implementation of other measures for the preservation and resilience of forests.

Guidelines for rural development have a positive impact on the provision of sustainable land and forest management (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The following guidelines will impact the environmental objective:

- ensuring the multi-functionality of space at a regional level with the region's green system,
- including forest, agricultural or water land and other open spaces (flood/overflow areas, safeguard zones) in the green system of a region,
- introducing the corridors for crossing infrastructure and enable ecological connectivity,
- connecting the green settlement system to the green regional system.

In accordance with the EU legislation³⁵ green infrastructure is “*a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are*

³⁵ COM(2013) 249 final: Communication from the Commission “Green Infrastructure – Enhancing Europe’s Natural Capital”.

concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, green infrastructure is present in rural and urban settings.”

Systematically including green infrastructure considerations in the planning and decision-making process will help reduce the loss of ecosystem services associated with future land take and help to improve and restore soil functions.

In recognition of this link, the Common Agricultural Policy (CAP) and rural development provide instruments and measures to encourage green infrastructure and to enhance areas with a high nature value in the countryside. This applies to large-scale direct support for farmers in the CAP’s first pillar, preventing land abandonment and fragmentation and to smaller-scale measures supported through rural development programmes in the second pillar, including non-productive investments, agro-environmental measures (e.g. farmed landscape conservation measures, maintaining and enhancing hedgerows, buffer strips, terraces, dry walls, sylvo-pastoral measures, etc.), payments fostering the coherence of Natura 2000, cooperation on maintaining valuable field boundaries, and conserving and restoring rural heritage features.

Because implementing green infrastructure approaches requires an integrated view of ecosystem services, it encourages a balanced approach that emphasises the multifunctional nature of rural areas, including access to sustainable, safe and nutritional food through short food supply chains. Green Infrastructure will therefore foster a more coherent approach to decision-making in relation to integrating ecological and sustainability concerns into spatial planning in the rural and urban landscape.

Guidelines for green infrastructure at the local and regional level have a positive impact on the provision of sustainable land and forest management (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and the coast

The following guidelines will impact sustainable soil management:

- developing the Port of Koper in connection to the development of Koper and on *preserving open undeveloped space for green infrastructure*, which is functionally connected to the sea and the general inland area and the green systems of the coastal towns/cities and the green system of the region,
- upgrading and establishing energy infrastructure for ensuring further development of the region,
- limiting areas for activities that are otherwise related to the sea and coast, although they are burdened by environmental, spatial and visual aspects,
- prioritising the contact between the sea, the coast and the hinterland via natural connections and co-natural regulations,
- establishing a coastal area along the length of the Slovenian coast, where construction is not permitted and that will be intended to protect nature and is part of the green system of coastal towns, other settlements and the region.

Guidelines for developing the sea and the coast contribute to the provision of sustainable soil management.

Guidelines for developing the sea and the coast have no direct impact on the provision of sustainable forest management.

1.5.2 Guidelines for tourist areas

The following guidelines will impact sustainable soil management:

- adapting tourism development to capacities and natural renewability of space as well as social acceptability in individual areas,
- focusing tourist infrastructure development to areas where the key tourist infrastructure is assured and not to new areas,
- providing common public infrastructure in tourist areas in open space that will enable regulated use along with conditions to preserve nature and waters and protect the soil;
- encouraging the renovation of tourist facilities or innovative solutions for accommodation in remote and coastal areas, where tourism contributes to the preservation of the population.

Guidelines for tourist areas contribute to the provision of sustainable soil management.

Guidelines for tourist areas have no direct impact on the provision of sustainable forest management.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

The following guidelines will impact sustainable soil and forest management:

- visibly degraded spaces are rehabilitated in the formation of settlements and non-built open space between settlements are preserved,
- the preservation or establishment of landscape recognition elements in the integration of spatial regulation, distribution of individual activities, land operations or regulation of agricultural, forest or aquatic areas (e.g. preservation of agricultural areas on remote and mountain areas, the preservation of forests in flat agricultural landscapes).

The guidelines for the preservation and improvement of the recognition of settlements and landscape contribute to assuring sustainable soil and forest management.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

Guidelines for nature protection areas and cultural heritage areas do not have an impact on the provision of sustainable soil and forest management.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The following guidelines will impact sustainable soil and forest management:

- the provision of spatial capacities for the use of renewable energy sources with the purpose of increasing their proportion in the primary energy balance in the country,
- the energy design of regions, towns and cities and local communities that is based on local energy self-supply from renewable sources and the sufficient capacity of smart distribution networks.

Comprehensive assessment of impacts of guidelines for special areas on the provision of sustainable soil and forest management: *guidelines for special areas and areas in the part that refers to soil and forest management, contribute to providing sustainable soil and forest management. Guidelines for special areas and areas have a positive impact on the provision of sustainable land and forest management (grade A).*

Set 2 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The following guidelines will impact sustainable soil and forest management:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, are developed in accordance with the polycentric urban system in Slovenia;
- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment.
- the design of cycling network creates a network of state long-distance cycling trails that connect urban centres with tourist settlements,
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics), which are connected to centres at levels I and II or to wider urban areas and other areas with functional connections;

The description of impacts on the provision of sustainable soil and forest management: The greatest impact of transport infrastructure development on soil and forests is expected in the development of the road and railway networks, while development in the maritime and air networks will be limited locally. The construction of transport infrastructure on soil or interventions in the forest cause extensive irreversible impacts: the soil in the area of traffic infrastructure is built and permanently degraded. Agricultural land and forests will be permanently destroyed on reconstructed transport infrastructure sections only in a narrow strip along the existing route, while new transport infrastructure construction will permanently destroy agricultural land and forest over the width of the road or railway line and maintenance areas. New traffic routes also permanently affect the fragmentation of agricultural and forest land. Short-term and reversible impacts that can be caused during construction, include negative impacts on accessibility to agricultural land or forest, damage of agricultural land (compaction) and damage on produce due to construction sites, soil pollution, etc. In the case of port regulation within the scope of inland waterways, short-term impact on bank erosion is possible and the construction can cause permanent impact of waves on bank erosion.

Due to the transportation infrastructure construction, the existing use of agricultural and forest land is being changed by the positioning of new infrastructure connections. The implementation measures could permanently reduce the scope of the best agricultural land and land with better productive potential, which would mean a permanent loss of soil function for agricultural production. If measures for the transportation infrastructure are positioned outside existing transport corridors, the fragmentation of agricultural and forest land will increase and the conditions for agricultural processing and forestry will worsen.

The integration of new infrastructure connections in an open and naturally conserved space could very well lead to activities in continuous forest areas with wood production functions at the first level and in areas of protective forests (irreversible destruction).

The construction of new and reconstruction of the existing transportation infrastructure are a source of large quantities of waste, which at the same time puts pressure on the acquisition of original raw mineral materials. Waste is not generated only temporarily during construction, instead it is generated permanently because of the maintenance of the transportation infrastructure. The impact of waste generation is permanent and in many cases irreversible in terms of natural resources. Therefore, this negative environmental impact should be reduced with measures of using recycled raw waste mineral materials.

The EU supplemented the policy framework in the field of waste management with the new framework Directive 2008/98/EC on waste. The Directive also introduces the objective regarding construction waste, whose preparation for reuse, recycling and material processing should increase to at least 70 percent of the total volume by 2020. The construction of new or expansion of the existing

transport infrastructure is the ideal opportunity for reuse or material reprocessing of construction waste, demolition waste and other mineral industrial waste.

Although the guidelines for developing transport infrastructure (point 2.1) indirectly contribute to enhancing sustainable soil and forest management as the result of implementing guidelines for spatial development, the impacts of guidelines on the development of the transportation infrastructure on ensuring sustainable soil and forest management are evaluated as insignificant under conditions (grade C).

General mitigating measures of the guidelines for developing the transportation infrastructure for achieving the goal of providing sustainable soil and forest management:

According to SDSS 2050, the transportation infrastructure is planned integrally, so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transportation subsystems are selected that enable a safe, affordable and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs and services. Furthermore, solutions are adjusted to the issue of accessibility and connectivity considering the characteristics and needs of various areas – in broader urban and rural areas, including remote and mountainous areas.

SDSS 2050 does not define its view regarding sustainable management of soil and forests, and does not specify its view on the placement of infrastructure in space in a way that it ensures minimum soil degradation and forest conservation and resilience. This is also understandable, as the priority of the integral planning of transport infrastructure is “to resolve issues of accessibility and connectivity”. It is necessary to ensure the attainment of the goals of sustainable management of soil and forests in the procedure of siting each individual transportation and infrastructure facility in space. The transportation infrastructure can be reconstructed or newly built provided that SDSS 2050 goals have been achieved and that soil degradation and the reduction of forest conservation and resilience are minimal.

In order to ensure sustainable soil management, policies for developing the transportation infrastructure must be complemented with policies that will promote recycling and the use of own waste raw mineral materials when building and reconstructing transport infrastructure and, what is more, the use of certified building materials from recycled side products or waste materials generated in other sectors. When using building materials for the transportation infrastructure that are not of primary natural origin, the fact should be taken into account that:

- large quantities of building materials are used, especially as construction fillings;
- certain hazardous substances from waste materials are permanently mobilised; and
- new building materials may have better functional properties than materials of natural origin.

The general mitigation measures provided for attaining the goal (1) 'Ensure sustainable management of soil and forests' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed in particular when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **surface area and the proportion of artificial land area**, separately for developed and undeveloped artificial land – indicators of the land use and land cover survey (LUCAS) for the area of Slovenia;

- **surface area and the proportion of forest area** – indicators of the land use and land cover survey (LUCAS) for the area of Slovenia;
- **[OD07] Waste management:** reworking construction waste and demolition waste.

2.2 GUIDELINES FOR DEVELOPING THE ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The following guidelines will impact sustainable soil management:

- promoting the construction of new production units in areas with sufficiently large consumption for cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration,
- determining the areas for the production of renewable sources of energy where exploitable potentials, while using the best available technology (BAT), can be exploited in the most optimum way.

Guidelines for developing the energy infrastructure in support of a transition into a low-carbon society impact the provision of sustainable forest management. Wood is a natural and renewable raw material that can be reused and recycled. The use of wood is sustainable only if wood comes from sustainably managed forests and is processed and used in such a way that the negative impact on climate and the environment is minimum.

58 percent of cut wood biomass in the European Union is entirely used as a raw material in industrial production. The remaining 42 percent of wood biomass are used to produce energy, which accounts for approximately 5 percent of total energy consumption in the European Union.

Considering national action plans for renewable energy of Member States, in 2020, biomass will be the main source of renewable energy. It is estimated that additional measures will have to be adopted at the EU level, including harmonised sustainability criteria for resolving issues related to sustainable use of solid and gas biomass for heating, cooling and electricity.

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

The description of impacts as per point 2.3 on the provision of sustainable soil and forest management: The SDSS 2050 emphasises that attention must be given to integrating facilities for exploiting renewable and low-carbon energy sources in space and to planning the same intensity of renewable energy sources usage with the purpose that there will be no negative impacts on natural sources locally (soil, forest and agricultural land) and that the additional impact as the result of land occupation (degradation of soil, reduction of preservation and resilience of forest) as the result of establishing mandatory accompanying infrastructure of road and energy network (e.g. electric power lines, access roads, etc.) is still acceptable.

The impact of guidelines for developing energy infrastructure in support of a transition into a low-carbon society (point 2.2) and the impact of the guidelines for energy networks (point 2.3) on the provision of sustainable soil and forest management is evaluated as insignificant (grade B).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

The impact of the guidelines for protection and supply with raw mineral materials on the provision of sustainable soil and forest management is assessed as positive (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural and forest land, the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

The impact of guidelines for rural development, agriculture, forestry and fishing on the provision of sustainable soil and forest management is assessed as positive (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation have a positive impact on the provision of sustainable land and forest management (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the provision of sustainable land and forest management (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities have a positive impact on the provision of sustainable land and forest management (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other accidents have a positive impact on the provision of sustainable land and forest management (grade A).*

7.2.2 AIR

Environmental objective 2: Ensure the realisation of long-term goals for annual air pollutant emission amounts

Set 1 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The impact on the achievement of long-term goals for annual air pollutant emission amounts is caused mostly by the following guidelines:

- completely renovating settlements to *reduce carbon footprint* at the level of buildings, neighbourhoods and settlements, enhance resilience to climate change and reduce the need for their expansion;
- improving accessibility to services of general importance and services of general economic importance, accessibility of housing and jobs with sustainable mobility and reduced need for mobility;
- improving air quality in settlements by reducing emissions from combustion plants and means of transportation and improving the structure, type and volume of green areas and their maintenance as means to reduce emissions and improve air quality;
- improving infrastructure and sustainable mobility in rural settlements where tourism is developed;
- priority planning of district heating and building cooling systems with renewable or CO₂ neutral gases in wider urban areas, other areas for functional integration and more densely populated settlements;
- facilitating the accessibility of all required daily services in residential areas on foot;
- providing good accessibility of social infrastructure areas and employment areas in residential areas with sustainable mobility;
- priority siting of economic and business zones in settlements located near transportation hubs by providing good connections particularly with public transportation from all areas of a region and neighbouring regions;
- facilitating the accessibility of daily supply areas in urban and rural settlements on foot;
- siting shopping centres within intermodal hubs for passenger transportation by connecting at least public rail and bus transportation and promoting access with public transportation;
- concentrating urban structures near transportation hubs, public passenger transportation terminals and PPT stops, and siting supply and other business activities to PPT hubs and very near them;
- supporting the expansion of central pedestrian zones, the development of a cycling network and PPT when planning transportation areas in towns;
- priority planning of areas for long-term development in areas where good access through public transportation and other forms of public transportation can be organised, whereby existing options, particularly the railway, are to be used as a priority.

Guidelines for regulating and developing settlements for achieving long-term goals for annual air pollutant emission amounts: At the end of 2013, the European Commission adopted the clean air policy package. This package was based on an extensive overview of the recent European Union's policy in ambient air protection and includes the "A Clean Air Programme for Europe"³⁶ and it also contained the proposal for a renewed Directive on the reduction of national emissions of certain atmospheric pollutants (currently Directive (EU) 2016/2284 – hereinafter "new NEC Directive" and Directive on the limitation of emissions of certain pollutants into the air from medium combustion plants (currently Directive (EU) 2015/2193).

The summary of evaluation of effects of the "A Clean Air Programme for Europe"³⁷ emphasises that air pollution has a significant impact on the environment and health. There were more than 400,000 premature deaths in the EU in 2010, 62 percent of EU's territory was exposed to eutrophication, including 71 percent of ecosystems in Natura 2000 areas. Total external air pollution costs in that year were evaluated at a very high rate (from EUR 330 to 940 billion).

The Commission assessed that the structure of the air quality policy in the European Union is harmonised, although there was a need to establish a better connection between the control of pollution sources and upper limits as well as ambient air quality standards, so that the consideration of those provisions is actually ensured. The following reasons for problems were found based on numerous violations of air quality standards, especially in European cities:

- *emissions from diesel engines* cause violations of standards regarding NO₂ and NO_x - although ceiling values for NO_x emissions for diesel driven passenger cars became stricter, the evaluated average of NO_x emissions in real driving conditions slightly increased;
- *smaller heating devices* and concentrated local pollution cause the most severe violations of standards regarding particulates – household sources of solid fuels combustion are the primary pollution factor, where local pollution mostly exceeds limit values, some geographical locations combine a high concentration of pollutants and topography that prevents and effective dispersion of particulates;
- *harmonisation is more difficult and more expensive* due to insufficient harmonisation of national and local measures and due to the lack of capacities at the regional and local levels – often, local authorities introduced measures to reduce air pollution quite late. The lack of capacities for development, implementation and monitoring of plans to reduce pollution is also a part of the problem. Harmonisation of the Directive on national emission ceilings and action plans under the Directive 2008/50/EC on ambient air quality must be improved.

"A Clean Air Programme for Europe" emphasises that, for the purpose of achieving the long-term goal regarding air quality it will be required to:

- ensure the consideration of all main sectors because they all contribute to the concentration of particulates or ozone. The possibilities for cost efficient reduction of emissions are especially plausible in the sectors where emissions have been reduced the least so far (e.g. agriculture, medium large combustion devices, non-road mobile mechanisation and international marine traffic),
- ammonium emissions from agriculture cause other environmental impacts. Agriculture causes 90 percent of ammonium emissions and is thus the main factor of eutrophication. There is quite a significant unexploited potential for cost effective reductions in this area, where many of them would be beneficial for farmers;
- permanent pollution of the hinterland means that local measures are insufficient to effectively reduce impacts. A major part of main pollution problems affecting the hinterland pollution is outside the control of local competent authorities.

³⁶ COM(2013) 918 final; "A Clean Air Programme for Europe"

³⁷ SWD(2013) 532 final; Commission Staff Working Document: Executive summary of the impact assessment for "A Clean Air Programme for Europe"

The main instrument for achieving the “A Clean Air Programme for Europe” is the new NEC Directive (Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants). This directive stipulates national obligations to reduce the emissions of five pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonium and small solid particulates) that cause acidification, eutrophication and pollution with ground level ozone, leading to significant negative impacts on human health and the environment.

The new NEC Directive annuls and replaces the Directive 2001/81/EC of the date of its transfer (1 July 2018), to assure that the emission ceilings for 2010, stipulated in the previous NEC Directive, apply to 2020 and it stipulates more ambitious commitments to reduce emissions by 2030 in comparison to emissions in 2005.

The table below shows the reductions of pollutant emissions for the entire European Union and especially for Slovenia by 2030 in accordance with the provisions of the new NEC Directive.

Table 20: Reduction of annual pollutant emissions by 2030 with regard to 2005

	SO ₂	NH ₃	NM VOC	NO _x	PM _{2.5}
EU	-79%	-19%	-40%	-63%	-49%
Slovenia	-92%	-15%	-53%	-65%	-60%

The impact of the guidelines for the development of settlements on achieving the long-term goals for the annual air pollutant emission amount are assessed on the basis of the comparison of the guidelines with the measures to reduce air pollutant emission amounts and the reasons for planning those measures as are indicated and described in “A Clean Air Programme for Europe”. The guidelines for the development of settlements in the part referring to air pollutant emissions contribute to the reduction of annual air pollutant emission amounts.

Guidelines for settlement development have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The impact on the achievement of the long-term goals for annual air pollutant emission amounts is caused mostly by the following guidelines:

- improving sustainable mobility for access to housing, various services and jobs in urban settlements;
- re-parcelling and logically supplementing existing urban areas, primarily in areas with good accessibility by public passenger transportation, primarily rail transportation;
- supporting better public passenger transportation by enhancing traffic routes in wider urban areas and connecting them to neighbouring less densely populated areas with alternative means of public passenger transportation (e.g. transportation on call) to transfer points or hubs at the edge of functional urban areas;
- expanding the central intermodal terminal with rail and air passenger transportation and road public passenger transportation;
- developing a freight intermodal terminal at the crossroads of the Mediterranean and Baltic-Adriatic corridors with rail and maritime transportation at the port of Koper;
- priority handling of problems with the Ljubljana rail hub to provide suitable track capacity to increase the flow of passenger and freight transportation.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for urban development on achieving long-term objectives for annual air pollutant emission amounts apply to the descriptions and assessments of the impacts of the guidelines for urban

development on achieving long-term objectives for annual air pollutant emission amounts. Guidelines for urban development contribute to the reduction of annual air pollutant emission amounts.

Guidelines for urban development have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The impact on the achievement of the long-term goals for annual air pollutant emission amounts is caused mostly by the following guidelines:

- reducing the needs for daily long-distance commute to work to centres of the highest level;
- improving accessibility to jobs and activities in centres at levels III and IV by public transportation;
- priority development of agriculture, forestry and related activities;
- enhancing the use of renewable energy sources for local development;
- preparing alternative modes of public transportation and improving sustainable mobility to support further settlement of mountain and remote areas;
- integrating rural settlements in wider urban areas and other areas for functional integration into a public passenger transportation and sustainable mobility system;
- reducing the share of means of transportation running on fossil fuels, while boosting the efficiency of sustainable mobility;
- creating short local supply chains, reducing transportation costs and environmental pollution by dedicating agricultural land to food production to supply towns outside of wider urban areas and other areas for functional integration with a high production potential and near centres,
- optimising the acquisition of raw mineral materials and gradual closure of small facilities and rehabilitation of illegal excavation sites.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for rural development on achieving long-term objectives for annual air pollutant emission amounts apply to the descriptions and assessments of the impacts of the guidelines for urban development on achieving the long-term objectives for annual air pollutant emission amounts. Guidelines for rural development contribute to the reduction of annual air pollutant emission amounts.

Guidelines for rural development have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

Guidelines for green infrastructure at the regional and local level do not have an impact on achieving the long-term objectives for annual air pollutant emission amounts or the impact is positive.

Guidelines for green infrastructure at the regional and local level have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts.

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and coast

The impact on the achievement of the long-term goals for annual air pollutant emission amounts is caused mostly by the following guidelines:

- enhancing mutual functional integration of coastal towns in wider urban areas, particularly in terms of public transportation;
- strengthening transboundary public passenger connections;
- upgrading and establishing the required energy infrastructure, including a gas transmission network for natural gas and renewable gases and CO₂ neutral gases;
- focusing tourism on quality and environmental sustainability with a special emphasis on access to destinations.

Guidelines for developing the sea and coast have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts.

1.5.2 Guidelines for tourist areas

As tourist areas are developed, the number of visitors increases and, as a result, traffic increases and consequently so does the emission of pollutants in the air. Furthermore, tourism development requires a suitable infrastructure that contributes to additional emissions. The SDSS guidelines for tourism development encourage and implement sustainable mobility and strive for ensuring accessibility to tourist areas with sustainable mobility. The development of the tourist infrastructure directs visitors to areas with an already established provided key tourist infrastructure and does not introduce new areas for tourism.

Guidelines for tourist development have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

Guidelines for preserving and improving the recognisability of settlements and the landscape do not have an impact on annual air pollutant emission amounts or the impact is positive.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

Guidelines for protected natural areas and cultural heritage areas do not have an impact on achieving the long-term objectives for annual air pollutant emission amounts or the impact is positive.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

Guidelines for providing spatial capacities for a low-carbon society have indirect and direct positive impacts on the annual air pollutant emission amounts because they encourage:

- greater energy efficiency in developing and renewing urban and rural settlements and villages, transportation, industry and the economy, tourism, agriculture, public administration and households;
- the provision of spatial capacities for the use of renewable energy sources with the purpose of increasing their proportion in the primary energy balance in the country, including promoting the use of renewable gases in the gas network,
- the energy design of regions, towns and cities and local communities that is based on the local energy self-supply from renewable sources and the sufficient capacity of smart distribution networks,
- local business models for producing energy from renewable sources (e.g. energy community) that contribute to the local supply,

- in areas with sufficiently large consumption, the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, and
- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity and recognisable settlement and landscape features and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The comprehensive assessment of guidelines for special areas and areas on the reduction of annual air pollutant emission amounts: guidelines for special areas and areas in the part that refers to air pollutant emissions contribute to the reduction of the annual air pollutant emission amounts. Guidelines for special areas have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).

Set 2 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING THE TRANSPORTATION INFRASTRUCTURE

Guidelines include guidelines for developing the transportation infrastructure and services on it, which supports the development of the polycentric urban system and inclusion of the state in international traffic flows. Guidelines included in this group address specifically:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transportation network, are developed in accordance with the polycentric urban system in Slovenia;
- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling, the use of public passenger transportation. When planning, sustainable mobility is provided with the integration of spatial (urban) and transportation planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes that connect urban centres and tourist settlements and are connected to the long-distance European cycling connections that run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transportation logistics), which are connected to centres at levels I and II or to wider urban areas and other areas with functional connections;
- the transportation infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and combinations of transportation subsystems are selected that enable a safe, affordable and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs and services.

The guidelines for the development of the transportation infrastructure in the part referring to air pollutant emissions, contribute to the reduction of annual air pollutant emission amounts. *Guidelines for traffic infrastructure development have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).*

2.2 GUIDELINES FOR DEVELOPING THE ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The impact on the achievement of the long-term goals for annual air pollutant emission amounts is caused mostly by the following guidelines:

- encouraging greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry and the economy, tourism, agriculture, public administration and households;
- replacing fossil fuels by using technologically and economically exploitable potentials of renewable sources,
- promoting the use of renewable gases in the gas network;
- supporting local business models for producing energy from renewable sources that contribute to the local supply, particularly in mountain areas and remote areas,
- encouraging the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, in areas with a sufficiently large consumption.

The guidelines for the development of the energy infrastructure in support of a transition into a low-carbon society in the part referring to air pollutant emissions, contribute to the reduction of annual air pollutant emission amounts. *Guidelines for traffic infrastructure development to support the transition to low-carbon society have a positive impact on achieving long-term objectives for annual air pollutant emission amounts (grade A).*

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

The guidelines for energy networks have an indirect (restoration and upgrade of electric network) and direct (restoration and upgrade of gas network) positive impact on achieving the long-term goals for annual air pollutant emission amounts (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

Guidelines for protection and supply with raw mineral materials do not have an impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for rural development, agriculture, forestry and fishing do not have an impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature preservation do not have a direct impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities do not have a direct impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters do not have a direct impact on achieving the long-term objectives for annual air pollutant emission amounts (grade A).*

Indicator for status monitoring:

- **[ZR14] Projections for air pollutant emissions:** the indicator shows data regarding the actual emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), ammonia (NH₃) and dust particles (PM_{2.5}) in the 2000–2015 period and the projections for these pollutants for 2015, 2020, 2025 and 2030. The emissions are shown in kilotonnes (kt).

7.2.3 WATER

Environmental objective 3: Prevent deterioration in the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters

Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines in particular contribute to the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters:

- settlements are planned primarily through renovation and internal development within the area of existing settlements, reducing the need for their expansion;
- further expansion of individual settlements is prevented, only existing individual settlements outside of endangered areas are preserved;
- withdrawing settlements and infrastructure from endangered areas, and preserving and establishing overflow areas;
- including water and waterside areas in green belts between settlements, which are part of the settlement's green system related to the green system of a region;
- preventing turning green areas into car parks;
- areas earmarked for long-term development must not increase the vulnerability of space in the wider area of a settlement (they must not degrade flood safety or affect natural overflow areas).

Impact of the guidelines for planning and developing settlements on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters: in accordance with Water Framework Directive 2000/60/EC, which is a general requirement of European politics in the field of water regulation was laid down to ensure good ecological status of surface waters and to minimum chemical standards that refer to surface waters.

Good ecological status is classified in Annex V of Water Framework Directive 2000/60/EC and refers to the quality of the biological status of waters, hydrological characteristics and chemical properties. Since absolute standards for the biological quality of waters, which would apply uniformly to the whole Community, may not be determined, administrative mechanisms that only support slight distortion from the expected biological status of waters in the conditions of minimum anthropogenic impact were determined throughout Europe due to the ecological variability of waters in Europe. A set of procedures to determine a good ecological status of individual water bodies and chemical or hydromorphological standards to attain this objective was provided together with a system to ensure that each Member State interprets the procedure of defining good ecological status of waters in a consistent manner to allow for comparability. The system of defining a good ecological status is

slightly complicated, which is unavoidable in view of the scope of ecological variability of waters in Europe and many parameters that need to be addressed.

When defining the ecological status of an individual surface water bodies in Slovenia, the following factors are taken into account:

- the status of communities of aquatic flora, algae, non-vertebrates and fish (so-called biological quality elements);
- general physico-chemical elements (nutrients and parameters of pollution by organic substance);
- hydromorphological elements (hydrological regime, flow continuity and morphological conditions); and
- the concentration of specific pollutants discharging into the aquatic environment.

The assessment of the ecological status of water bodies provides a distortion of the assessed ecosystem from natural condition, i.e. the status it would have without the influence of human activity. Ecological status is assessed according to a five-level scale: very good, good, moderate, poor or very bad ecological status.

In accordance with Water Framework Directive 2000/60/EC, *good chemical status* is defined as compliance with all quality standards determined for chemical substances at the European level. Directive 2000/60/EC also defines a mechanism to renew these standards and establish new standards through a mechanism to determine priority hazardous substances for hazardous chemicals. This provides at least minimum chemical quality, particularly with regard to highly toxic substances, for the whole of the European Union.

All elements of an analysis to determine the good ecological and good chemical status of waters must be determined in a river basin management plan. A river basin management plan is a detailed report on how to attain the objectives set for a river basin (ecological status, quantitative status, chemical status and objectives of protected areas) in the required period. A river basin management plan includes all results of an analysis to determine the status of waters: the characteristics of the river basin, an overview of the impact of human activity on the status of waters in the river basin, an impact assessment of the existing legislation and a set of measures to fill the established gaps and relevant for the analysis to determine the status of waters. Within the preparation of the river basin management plan, an economic analysis of the use of water in the river basin must be carried out.

The *Water Management Plan for the Adriatic Sea Basin 2016–2021* and the *Water Management Plan for the Danube River Basin 2016–2021* were adopted for waters in Slovenia.

The outlined plans include environmental objectives for each surface water body in Slovenia pursuant to Article 4 of Water Framework Directive 2000/60/EC. The environmental objectives are established to provide in particular for the following:

- the protection, improvement and restoration of surface water bodies to achieve a good ecological and chemical status of surface water in accordance with regulations governing environmental protection;
- the protection and improvement of all artificial and heavily modified water bodies to achieve good ecological potential and good chemical status of water in accordance with the regulations governing environmental protection; and
- gradual reduction of pollution by priority substances, and the ceasing or phasing out emissions, discharge and loss of priority hazardous substances.

96 per cent of all surface water bodies in Slovenia are defined as having a good chemical status, while five sea water bodies have a poor chemical status due to the presence of tributyltin compounds. In general, Slovenian surface waters are not polluted by priority or priority hazardous substances.

Between 2009 and 2015, 59 per cent of all surface waters in Slovenia were assessed as having a good ecological status. Hydromorphological changes and general degradation are the main reasons for the moderate or poor ecological status of surface waters.

Water management plans drafted and adopted by Member States for each six-year period separately are revised by the Commission, which then issues a report on the conclusions of the revision of the plan compliance with the requirements of European legislation. With regard to water management plans currently applicable in Slovenia, the Commission recommends:

- to continue improving the monitoring of surface waters by including all relevant quality elements in all water categories and complete the development of assessment methods for all suitable biological quality elements in all water categories;
- to clearly distinguish between the definition of heavily modified surface water bodies and the application of exceptions. The application of the exemption provided for in Article 4(7) must be based on the assessment of all measures required by the Directive;
- to support the implementation of measures to relieve hydromorphological pressures, if necessary, by revising permits/concessions and allocating the required funds.

The impacts of the guidelines for developing settlements on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters are assessed on the basis of a comparison of the guidelines with measures to attain a good ecological and chemical status of surface waters referred to in the *Water Management Plan for the Adriatic Sea Basin 2016–2021* and the *Water Management Plan for the Danube River Basin 2016–2021* were adopted for waters in Slovenia

Guidelines for planning and developing settlements contribute to reduced pressure on the ecological and chemical status of surface waters.

Guidelines for planning and developing settlements have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Urban development of towns and other urban settlements is crucial for the improvement of the economic, social and environmental efficiency of the state. Urban settlements are the most important elements in urban development, where the population density increases with renovations or expansions. Increased point source environmental pollution by an increased quantity of urban waste water due to higher population density in individual urban areas may constitute a potentially negative impact on the prevention of the deterioration in the status of surface waters and the attainment of a good ecological status/potential and good chemical status of surface waters. Residential areas, areas for social infrastructure and areas for the needs of the economy are provided, as a priority, by renovating existing, urbanised and degraded areas (densification of urban structure), making the impact of the pressure of developments on water and coastal land negligible.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters apply to the descriptions and impact assessments of the guidelines for urban development on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters. Guidelines for urban development contribute to the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters.

Guidelines for urban development have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines in particular contribute to the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters:

- priority development of agriculture, forestry and related activities, while taking into account development trends aimed at the modernisation of these activities and the utilisation of natural resources;
- withdrawing settlements and infrastructure from endangered areas, and preserving and establishing overflow areas;
- adjusting natural resource management to options for natural restoration;
- comprehensive planning of agricultural space while taking into account the potential for various types of agricultural production and guidelines for preserving ecological connectivity, protecting *habitats* and *waters* and recognisable landscape features;
- guiding agriculture towards organic farming in environmentally sensitive areas, protected areas and in the vicinity of settlements;
- seeking options for the common use of water resources with energy utilisation while taking into account limitations due to other protection aspects (to adapt to climate change in agriculture);
- priority preservation of forest areas in agricultural flat areas and their inclusion in the green system of the region on account of their contribution to the quality of surface rain water or their role in the purification of waters from agricultural land and the mitigation of the effects of the use of plant protection products on agricultural land;
- preparing innovative solutions to discharge waste water in karst areas;
- ensuring the bridging of water areas so as not to increase flood risk;
- water management planning generally follows sustainable plans with natural and available materials nearby;
- improving the hydromorphological status of regulated surface waters or setting up an ecological and structural role of waters in the landscape as long as this is not contrary to the provision of flood safety;
- fluvial deposits are abstracted in accordance with limitations in the field of nature and watercourse conservation.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters apply to the descriptions and impact assessments of the guidelines for rural development on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters. Guidelines for rural development contribute to reduced pressure on the prevention of the deterioration in the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters.

Guidelines for rural development have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The following guidelines in particular contribute to the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters:

- adapting to climate change by preserving overflow areas/floodplains within the green system of regions;
- including forest, agricultural, water areas and other open spaces (flood/overflow areas, safeguard zones) in the green system of a region.

The inclusion of green infrastructure in river basin management may significantly contribute to high-quality water, the mitigation of the effects of hydromorphological pressures and of floods and drought³⁸. Green infrastructure also provides cost-effective options for better implementation of Directive 98/83/EC on drinking water and Directive 2006/118/EC on groundwater. Innovative green solutions for urban waste water treatment are also being developed, which bring several benefits, are very effective and cost-effective³⁹.

Guidelines for green infrastructure at regional and local levels have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and coast

The following guidelines in particular contribute to the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters:

- limiting surfaces for activities that pollute the environment (discharges of waste water, oil, lubricant);
- seeking alternative solutions for activities that may be carried out elsewhere away from the sea and coast;
- including activities to adapt to climate change in the development strategies of the coast or tourism in the coastal area, particularly the adaptation of settlement areas to sea level rise, more droughts, lack of drinking water and water for business, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services;
- establishing a coastal area along the length of the coast intended to conserve nature/preserve natural habitats and landscape, natural resources and ecosystems for ecological connections between inland areas and the sea and the adaptation to climate change.

Guidelines for developing the sea and coast contribute to the attainment of a good ecological and chemical status of surface waters.

1.5.2 Guidelines for tourist areas

The following guidelines in particular contribute to the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters:

³⁸ COM(2012) 673 final; Communication from the Commission; A Blueprint to Safeguard Europe's Water Resources.

³⁹ Integrated constructed wetlands are an example of green infrastructure that may help to attain the objectives of EU policy regarding urban waste water treatment and bathing water protection.

- tourism development either through infrastructure or visits must not put resources and their quality at risk or irreversibly change them;
- supporting sustainable tourism development that is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility;
- tourism development does not open new areas for tourism, particularly not in naturally preserved areas and quiet natural areas, and in endangered, sensitive or water-scarce areas;
- focusing further development of the existing tourist infrastructure on unburdening, reconstructing and modernising existing tourist capacities in terms of increased quality of accommodations, services and programmes, reduced water consumption and waste, and improved infrastructure and services for sustainable mobility;
- providing common public infrastructure in tourist areas in open spaces that are attractive to both providers and users (e.g. rivers), which will facilitate organised use along with the necessary conditions to preserve nature and waters, and protect the soil;
- promoting the restoration of tourist facilities or innovative accommodation solutions in remote (mountain) and border areas that are self-sustaining in terms of use;
- defining and harmonising the potentials of Slovenian rivers, lakes and anthropogenic lakes for various purposes, and limitations within regional spatial plans;
- tourism in towns brings increased consumption of natural resources (water supply, water discharge, waste, food, passenger transport).

Guidelines for tourist areas contribute to reduced pressure on the ecological and chemical status of surface waters as a consequence of further tourism development.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

Guidelines for preserving and improving the recognisability of settlements and the landscape do not have an impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters, or the impact is positive.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

Guidelines for nature protection areas and cultural heritage areas do not have an impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters, or the impact is positive.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

Guidelines for providing spatial capacities for a low-carbon society have direct and indirect positive impacts on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters, as they promote:

- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The comprehensive impact assessment of the guidelines for special areas and regions on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters: Guidelines for special areas

and regions have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

Set 2 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

Guidelines include the guidelines for developing transport infrastructure and the services within it, which supports the development of the polycentric urban system and the inclusion of the state in international traffic flows. Guidelines included in this group address specifically:

- corridors and entry points in the network of rail and road connections, which are functionally connected to the European transport network, are developed in accordance with the polycentric urban system in Slovenia;
- the needs of residents and visitors to Slovenia for sustainable mobility while reducing traffic and the adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling and the use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes that connect urban centres and tourist settlements and are connected to the long-distance European cycling routes that run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics), which are connected to centres at levels I and II or to wider urban areas and other areas for functional integration;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

The greatest impacts on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters are expected in the development of road and rail network, while impacts of interventions in maritime water and air network are limited locally. Impacts on surface water, groundwater, transitional water, coastal water and sources of drinking water are characteristic of the period of construction or reconstruction of the transport infrastructure, as well as afterwards. They are largely limited to the local environment, while in the case of major pollution accidents, the impact is also felt regionally and across the border. During the construction or reconstruction of the transport infrastructure, impacts are mostly short term and reversible (for example, the impact on water quality). After the construction, impacts are mostly less extensive, although permanently irreversible (for example, the impact on the morphology of watercourses, hydrologic conditions, retention areas). The aforementioned impacts may bring changes in quality elements for the establishment of the ecological status of surface waters, which are biological and hydromorphological elements supporting biological elements, chemical and physico-chemical elements supporting biological elements, and the chemical status of waters. If the general guidelines and mitigation measures are observed, the changes in quality elements will not be so extensive as to threaten the attainment of the environmental objective.

Infrastructural interventions for road, rail, maritime water, air and public transport may have significant impacts on the attainment of a good ecological and chemical status of waters:

- positioning of infrastructure corridors may permanently directly or indirectly impact the hydrological conditions in a certain area, and bridging structures may impact the eco-morphological situation in a watercourse;
- continuous leaching of hazardous substances which are the result of pollution from transport (impact on the quality of surface waters, potential impact on bathing waters);
- spillage of hazardous substances due to an extraordinary event (potential direct, remote and transboundary impact on the quality of the sea, surface waters, potential impact on bathing waters);
- increased existing flood risk due to lines (applicable to new construction and the reconstruction of existing infrastructure lines) running in floodplains or watercourse regulations: changes in the hydrological situation in an area, including the reduction of retention areas (direct and remote).

The Water Act (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 67/02, 57/08, 57/12, 100/13 and 40/14) stipulates that interventions in water and coastal land may be carried out if they are based on national spatial planning plans that cannot be positioned elsewhere without generating disproportionately high costs. The positioning of such activities may significantly impact the ecological status of watercourses, and reduce retention areas and the cumulative impacts on the biodiversity of the area and ecosystems services of the area.

Guidelines for developing transport infrastructure foster the development of the polycentric urban system and the inclusion of the state in international traffic flows, indirectly contributing to relieving pressures on certain aspects of environmental protection. Nevertheless, the impacts of the guidelines for developing transport infrastructure on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters are assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for developing transport infrastructure to attain the objective to prevent the deterioration in the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters:

Transport infrastructure corridors should be sited into the environment by:

- permanently not affecting, directly or indirectly, the hydrological condition of surface water;
- ensuring that the discharge of hazardous materials resulting from transport be prevented;
- preventing spillages of hazardous materials due to an incident during transport;
- not siting transport infrastructure facilities in a way that would increase flood risk.

The provided general mitigation measures for attaining the objective (3) 'Prevent the deterioration in the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 drafter (Ministry of the Environment and Spatial Planning). These measures will be observed in particular when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) as well as during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- [VD12] **Ecological and chemical status of surface waters:** this indicator is an assessment of the chemical and ecological status of surface waters and is provided in accordance with the criteria of Water Framework Directive 2000/60/EC. The assessment includes all inland surface waters, transitional waters, and coastal waters; with regard to the chemical status, territorial water is also included. The basic unit for assessment is a water body, which means a separate and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

Guidelines for developing energy infrastructure referred to in the SDSS to support the transition to a low-carbon society may create, in the case of power generation by utilising hydropower potential, permanent direct and remote impacts on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters. The impacts of hydro power plants, which occur as a direct consequence of changes in hydromorphological characteristics (due to the abstraction of water, transversal facilities – water retention and the interruption of longitudinal connection, regulations and other arrangements of river beds and the use of the riparian zone) or indirectly as a consequence of the impacts of hydromorphological changes on biological, physico-chemical and hydromorphological elements of water quality triggered by changed or modified water bodies are taken into account.

The impacts of hydro power plants (small hydro power plants and hydro power plants) on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters must be assessed particularly in view of the following environmental objectives:

- surface and underground water status must not worsen, while the status of water bodies that do not have a good status needs to improve,
- good water status must be attained by 2021 or in one of the subsequent six-year cycles;
- standards and objectives must be attained in accordance with the regulations governing nature conservation.

Impact on ecological and chemical status must be addressed separately for areas upstream from the dam building (generalised, within the dam) and downstream from the dam building, since different types of pollution produce different impacts on water status.

Generally, the negative impacts of hydro power plants in the aquatic environment are prevented by the attainment of a good status of surface waters in areas of influence of hydro power plants. This is why heavily modified and artificial water bodies have been determined for certain existing HPP, which fall under “specific environmental objectives”. Artificial and heavily modified water bodies are a specific category of water bodies – with their own classification and objectives – which is related to other commitments in fulfilling the adopted socio-economic objectives that had to be achieved before this particular category of water bodies was introduced on the basis of the criteria referred to in the Water Framework Directive 2000/60/EC.

If it is established on the basis of a strategic environmental assessment of new hydro power plants on water status that even the implementation of mitigation measures cannot prevent the deterioration in water status, exceptions for siting new hydro power plants in the aquatic environment may be made, which are part of environmental objectives stipulated by Article 4 of Water Framework Directive 2000/60/EC. These are temporary exceptions for medium and long-term distortions from the attainment of good water status by 2021 and the conclusion of one of subsequent six-year cycles, respectively, and refer to new (planned) modifications to the physical characteristics of a surface water body or alterations to the level of groundwater body or ineffective prevention of the deterioration in

the status of surface water body (including from very good to good status) due to sustainable development activities (Article 4(7) of Water Framework Directive 2000/60/EC).

In accordance with the Slovenian legislation, distortions from environmental objectives (pursuant to Article 4(7) of the Water Framework Directive) are only permitted if the conditions stipulated by the Water Act (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 67/2002, 110/2002-ZGO-1, 2/2004-ZZdrI-A, 41/2004-ZVO-1, 57/2008), the Decree on the detailed content and method of drawing up a water management plan (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 26/06, 5/09) and the Water Framework Directive are met.

The impacts of the guidelines for developing energy infrastructure to support the transition to a low-carbon society on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters are assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for developing energy infrastructure to support the transition to a low-carbon society to attain the objective to prevent the deterioration in the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters:

Energy infrastructure should be sited into aquatic environments by:

- ensuring that the surface water status and the related groundwater status do not deteriorate;
- ensuring that a good water status is achieved in the period that is determined in the water management plan for the relevant surface water body;
- ensuring that the standards and objectives that are prescribed for the area of this water body in accordance with the regulations governing nature preservation are met; and
- ensuring that prior approval is obtained pursuant to regulations (Article 4(7) of Water Framework Directive 2000/60/EC) in the event of activities affecting the aquatic environment and preventing the achievement of a good water status.

The provided general mitigation measures for attaining the objective (3) 'Prevent the deterioration in the status of surface waters and ensure the attainment of a good ecological status/potential and good chemical status of surface waters' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 drafter (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[VD12] Ecological and chemical status of surface waters:** this indicator is an assessment of the chemical and ecological status of surface water and is given in accordance with the criteria of Water Framework Directive 2000/60/EC. The assessment includes all inland surface waters, transitional waters, and coastal waters; with regard to the chemical status, territorial water is also included. The basic unit for assessment is a water body, which means a separate and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water.

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

Guidelines for energy networks do not have an impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

Guidelines for protecting and supplying raw mineral materials do not have an impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for rural development, agriculture, forestry and fisheries have an insignificant impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade B).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account the guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities do not have a direct impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters have a positive impact on the prevention of the deterioration in the status of surface waters, and the attainment of a good ecological status/potential and good chemical status of surface waters (grade A).*

Environmental objective 4: Preserve or ensure a good quantitative and chemical status of groundwater

Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines in particular have a direct impact on ensuring a good quantitative and chemical status of groundwater:

1. Regarding the provision of a good chemical status of groundwater:

- settlements are planned primarily through renovation and internal development within the area of existing settlements, reducing the share and size of degraded areas;
- further expansion of individual settlements is prevented, only existing individual settlements that comprise less than ten residential buildings are preserved (outside of endangered areas);
- withdrawing settlements and infrastructure from endangered areas, and preserving and establishing overflow areas;
- priority siting of economic and business zones in abandoned industrial, municipal, transport and similar degraded areas or in existing economic and business zones;

- areas earmarked for long-term development must not increase the vulnerability of space in the wider area of a settlement (they must not degrade flood safety or affect natural overflow areas).
- priority siting of new shopping centres in degraded areas in urban settlements or on land that may be used for this purpose within the internal development of settlements as part of functional reorganisation or urban renovation of settlements or their sections; and

2. *Regarding the provision of a good quantitative status of groundwater:*

- establishing natural safeguards against extreme events and heat islands with more well-maintained green areas as elements of the green infrastructure, the green system of regions and towns;
- priority provision of areas for residential buildings by restoring degraded areas or existing low-density residential areas, while providing sufficient open public built-up and green areas;
- preventing turning green areas into car parks.

Impacts of the guidelines for planning and developing settlements on the preservation or provision of a good quantitative and chemical status of groundwater: Water Framework Directive 2000/60/EC imposes on Member States the following requirements regarding the attainment of a good quantitative and chemical status of groundwater:

- defining groundwater bodies;
- establishing registers of protected areas within each water area for the areas of groundwater or habitats and species that directly depend on water. Registers must include all water bodies used to obtain drinking water and all protected areas covered by the Bathing Water Directive, vulnerable areas in accordance with the Nitrates Directive and sensitive areas in accordance with the Urban Waste Water Treatment Directive, and protected areas due to the protection of habitats and species, including the Natura 2000 sites;
- setting up networks to monitor the status of groundwater to provide a comprehensive overview of chemical and quantitative status of groundwater;
- adopting and implementing a river basin management plan for each water area, which must include a summary of pressures and impacts of human activity on the status of groundwater, a presentation in the form of a chart of monitoring results, a summary of the economic analysis of water use, a summary of protection and supervision programmes or remedial measures.

The definition of groundwater bodies and the obligation to manage them are included in more detail for each groundwater body separately in the *Water Management Plan for the Adriatic Sea Basin 2016–2021* and the *Water Management Plan for the Danube River Basin 2016–2021*.

Directive 2006/118/EC on groundwater determines groundwater quality standards and introduces measures to prevent or limit pollutant inputs to groundwater. Directive 2006/118/EC on groundwater amends Water Framework Directive 2000/60/EC regarding the groundwater quality standards and measures to prevent or limit pollutant inputs to groundwater.

The impacts of the guidelines for developing settlements on the preservation or provision of a good quantitative and chemical status of groundwater are assessed on the basis of a comparison of the guidelines with measures to attain a good quantitative and chemical status of groundwater referred to in the *Water Management Plan for the Adriatic Sea Basin 2016–2021* and the *Water Management Plan for the Danube River Basin 2016–2021*.

The section of the guidelines for developing settlements that refers to the quantitative and chemical status of groundwater promotes the provision of good quantitative and chemical status of groundwater.

Guidelines for developing settlements have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Urban development of towns and other urban settlements is crucial for the improvement of the economic, social and environmental efficiency of the state. Urban settlements are the most important elements in urban development, where the population density increases with renovations or expansions. Regarding the quantitative and chemical status of groundwater, a guideline included in guidelines for urban development, which states that sufficient open built-up and green areas (at least 40 per cent of the development area in settlements) must be provided in urban settlements or expansions, is of particular importance.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of good quantitative and chemical status of groundwater apply to the descriptions and impact assessments of the guidelines for urban development on the provision of a good quantitative and chemical status of groundwater. Guidelines for urban development contribute to reduced pressure on a good quantitative and chemical status of groundwater.

Guidelines for urban development have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines for rural development in particular have an impact on the preservation or provision of a good quantitative and chemical status of groundwater:

- priority development of agriculture, forestry and related activities, while taking into account development trends aimed at the modernisation of these activities and the utilisation of natural resources;
- withdrawing settlements and infrastructure from endangered areas, and preserving and establishing overflow areas;
- adjusting natural resource management to options for natural restoration;
- comprehensive planning of agricultural space, while taking into account the potential for various types of agricultural production, and guidelines for preserving ecological connectivity, protecting habitats and waters and recognisable landscape features;
- guiding agriculture towards organic farming in environmentally sensitive areas, protected areas and in the vicinity of settlements;
- priority preservation of forest areas in agricultural flat areas, and their inclusion in the green system of the region on account of their contribution to the quality of surface rain water or their role in the purification of waters from agricultural land and the mitigation of the effects of the use of plant protection products on agricultural land;
- ensuring high-quality drinking water for residents takes priority over other economic water uses. Water must be used with considerable concern for the recharging and long-term protection aquifers, which is the responsibility of the state;
- in karst areas that feature soil with a low self-cleaning ability, karstic floods and occasional or frequent water scarcity, local communities are provided assistance to devise innovative solutions for water supply and waste discharge, particularly as support for rural development;
- to resolve differences between uses in safeguard zones, options for complementary uses or uses that preserve the quality of a protected water resource are sought as a priority.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of a good quantitative and chemical status of groundwater apply to the descriptions and impact assessments of the guidelines for rural development from the aspect of ensuring a good quantitative and chemical status of groundwater.

Guidelines for rural development contribute to reduced pressure on a good quantitative and chemical status of groundwater.

Guidelines for rural development have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The following guidelines included in guidelines for green infrastructure at regional and local levels in particular have an impact on the preservation or provision of a good quantitative and chemical status of groundwater:

- adapting to climate change by preserving overflow areas/floodplains within the green system of regions;
- natural restoration of natural ecosystems, particularly the soil and forests;
- including forest, agricultural, water areas and other open spaces (flood/overflow areas, safeguard zones) in the green system of a region.

Guidelines for green infrastructure at regional and local levels have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and coast

The following guidelines included in guidelines for developing the sea and coast in particular have an impact on the preservation or provision of a good quantitative and chemical status of groundwater:

- limiting surfaces for activities that pollute the environment (discharges of waste water, oil, lubricant);
- seeking alternative solutions for activities that may be carried out elsewhere away from the sea and coast;
- including activities to adapt to climate change in development strategies of the coast or tourism in the coastal area, particularly the adaptation of settlement areas to sea level rise, more droughts, lack of drinking water and water for business, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services;
- establishing a coastal area along the length of the coast intended to conserve nature/preserve natural habitats and landscape, natural resources and ecosystems, for ecological connections between inland areas and the sea and the adaptation to climate change.

Guidelines for developing the sea and coast have only a partial and geographically limited impact on quantitative and chemical status of groundwater.

1.5.2 Guidelines for tourist areas

The following guidelines included in the guidelines for tourist areas in particular have an impact on the preservation or provision of good quantitative and chemical status of groundwater:

- tourism development either through infrastructure or visits must not put resources and their quality at risk or irreversibly change them;
- supporting sustainable tourism development that is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility;

- tourism development does not open new areas for tourism, particularly not in naturally preserved areas and quiet natural areas, or in endangered, sensitive or water-scarce areas;
- focusing further development of the existing tourist infrastructure on unburdening, reconstructing and modernising existing tourist capacities in terms of an increased quality of accommodations, services and programmes, reduced water consumption and waste, and improved infrastructure and services for sustainable mobility;
- tourism in towns brings increased consumption of natural resources (water supply, water discharge, waste, food, passenger transport).

Guidelines for tourist areas contribute to reduced pressure on a quantitative and chemical status of groundwater as a consequence of further tourism development.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

Guidelines for preserving and improving the recognisability of settlements and the landscape do not have an impact on the attainment of a good quantitative and chemical status of groundwater, or the impact is positive.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

Guidelines for nature protection areas and cultural heritage areas do not have an impact on the attainment of a good quantitative and chemical status of groundwater, or the impact is positive.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

Guidelines for providing spatial capacities for a low-carbon society have direct and indirect positive impacts on the attainment of a good quantitative and chemical status of groundwater, or the impact is positive, as they promote:

- the selection of areas for the production of renewable energy sources (including the utilisation of geothermal energy and the energy from shallow aquifers), where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The comprehensive impact assessment of the guidelines for special areas and regions on the attainment of good quantitative and chemical status of groundwater: *The section of the guidelines for special areas and regions that refers to quantitative and chemical status of groundwater promotes the preservation or provision of a good quantitative and chemical status of groundwater. Guidelines for special areas and regions have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).*

Set 2 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

Guidelines include the guidelines for developing transport infrastructure and services within it, which supports the development of the polycentric urban system and inclusion of the state in international traffic flows. Guidelines included in this group address specifically:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, are developed in accordance with the polycentric urban system in Slovenia;
- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling and the use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes that connect urban centres and tourist settlements and are connected to the long-distance European cycling routes that run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics) which are connected to centres at levels I and II or to wider urban areas and other areas for functional integration;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

Measures of road, rail, maritime water, air and public transport may have significant impacts on the provision of a good quantitative and chemical status of groundwater:

- the siting of infrastructural corridors may have a permanent direct or indirect impact on the hydrological status of aquifers;
- continuous leaching of hazardous substances that are the result of pollution from transport;
- spillage of hazardous substances due to an extraordinary event (potential direct, remote and transboundary impact on the quality of groundwater);
- changes in the water regime of groundwater due to draining water from the rear areas of tunnels (direct and remote);
- siting of transport infrastructure facilities in areas with extremely highly, very highly and highly vulnerable aquifers may have negative impacts on existing and potential water resources (direct, remote, transboundary);
- siting in safeguard zones of protected water resources (local, potentially regional and transboundary impact).

Guidelines for developing transport infrastructure foster the development of the polycentric urban system and the inclusion of the state in international traffic flows, indirectly contributing to relieving pressures on certain aspects of environmental protection. Nevertheless, the impacts of the guidelines for developing transport infrastructure on the preservation or provision of a good quantitative and chemical status of groundwater are assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for developing transport infrastructure to attain the objective to preserve or ensure a good quantitative and chemical status of groundwater:

Transport infrastructure corridors should be sited into the environment by:

- permanently not affecting, directly or indirectly, the hydrological status of aquifers,
- ensuring that the leaching of hazardous materials resulting from transport be prevented,
- preventing leakages/spillages of hazardous materials due to an incident during transport,
- not affecting the groundwater regime due to the drainage of water from areas behind tunnels,
- not siting transport infrastructure facilities in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- avoiding the siting of transport infrastructure in water protection areas with drinking water resources.

The provided general mitigation measures for attaining the objective (4) ‘Preserve or ensure a good quantitative and chemical status of groundwater’ must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) as well as during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[VD15] Groundwater recharge: This indicator is expressed as annual groundwater recharge of shallow aquifers in a hydrological year (1 November–31 October) in all groundwater bodies for the entire territory of the Republic of Slovenia.

-[VD11] Groundwater quality: This indicator presents the assessment of the chemical status of groundwater. Based on the monitoring data, the chemical status of groundwater bodies is assessed every year, while assessments in six-year water management reporting periods are also conducted. Upward or downward trends in measured values of chemical parameters are also monitored.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The status of groundwater is affected by technologies for the utilisation of geothermal energy and the heat from shallow aquifers, which utilise groundwater or the soil as a geothermal heat source. The actual effect of impacts of the utilisation of geothermal heat sources on groundwater depends on:

- the type of the geothermal heat source (shallow geothermal sources, low-enthalpy hydrothermal source, high-enthalpy hydrothermal source);
- the location of the geothermal heat source;
- the duration of individual phases of the building or decommissioning of the system for the utilisation of the geothermal heat source;
- the sensitivity of the receiver of adverse impacts; and
- pressures on the current status of the aquatic environment by other types of activities in the area of influence of the utilisation of the geothermal heat source.

Geothermal energy

Technological processes of geothermal water use differ according to the purpose (balneology, heating, district heating, nurseries) and complexity. The cascading use of thermal water prevails in the use of water from geothermal aquifers in north-eastern Slovenia, whereby the heating of space and sanitary water is followed by the heating of a swimming pool complex with balneology. The heating of nurseries and district heating are also included. The use of geothermal energy may have a potentially negative impact on groundwater (lower level, the intrusion of cold water next to the borehole in the case of excessive utilisation). Impacts may be permanent, direct and remote. The utilisation of geothermal energy by abstracting heat from groundwater must be sustainable and a poor quantitative status of groundwater bodies must be prevented.

All technologies of geothermal water use share the need for thermal water where the quantity abstracted from aquifers must be as low as possible and sufficiently returned to aquifers in order to pursue environmental objectives and the sustainable use of energy potential. Reinjection wells may be employed to increase the number of users and geothermal energy use, while attainment of the

environmental objectives to preserve or ensure a good quantitative status of groundwater at the same time.

The utilisation of low-enthalpy geothermal sources has no significant impacts on groundwater if the method of utilisation ensures that the medium for geothermal heat transmission to the surface is returned into the subsoil. Operation of the geothermal heat source facilities in the event of medium re-injection for the geothermal heat transmission therefore has no significant impact on ground and surface waters. The request for re-injecting water in geothermal heating systems if it is technologically feasible. However, it must be pointed out that, throughout their operation (direct impact), aquifers are more sensitive to external factors (e.g. input of plant protection products and fertilisers if the reservoir is located on agricultural land, heavy metals from the soil etc.) as the earth cover is perforated. The erection of several facilities for the use of geothermal energy in the same aquifer and their depth also pose a constant threat (remote impact).

Heat from shallow aquifers

Ground source or water/water heat pumps reach the subsoil and may have significant negative impacts on groundwater. Ground source heat pumps utilise the energy of the surrounding soil for pumping. There are vertical and horizontal systems; horizontal systems require more extensive excavation.

Vertical systems, on the other hand, only require boreholes. Liquid containing an anti-freeze agent circulate through heat pump tubes. In the case of spillage of the liquid, groundwater may become polluted. If taking into account all of the prescribed standards for the construction and operation of heat pumps, the probability of such events is low (the impact is assessed as insignificant).

Water/water heat pumps utilise the energy of groundwater (the constant temperature of groundwater is between 7°C and 12°C). Extraction and drain wells must be drilled, and a submersible pump is placed into the extraction well. The water/water system may not exist without a drain well due to negative impacts on the quantitative status of groundwater (lower level).

Throughout their operation (permanent impact), aquifers are more sensitive to external factors (e.g. the input of plant protection products and fertilisers if the reservoir is located on agricultural land, heavy metals from the soil etc.) as the earth cover is perforated. To prevent negative impacts on groundwater, general and special conditions for the installation of geothermal heat pumps must be taken into account, and the increasing installation of systems utilising shallow geothermal energy should be regulated at the legislative level.

The impacts of the guidelines for developing energy infrastructure to support the transition to a low-carbon society on the preservation or provision of a good quantitative and chemical status of groundwater are assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for developing energy infrastructure to support the transition to a low-carbon society to attain the objective to preserve or ensure a good quantitative and chemical status of groundwater:

With the purpose of reducing the effect of impacts on groundwater due to the use of geothermal heat sources, technical regulations, particularly those related to the use of shallow geothermal sources and high enthalpy hydrothermal sources, should be used to provide rules on how to act with regard to:

- the selection of the most appropriate location of a geothermal heat source;
- the definition of the aquifer's sensitivity to adverse effects;
- the method of re-injecting a fluid when using low-enthalpy geothermal sources;
- the method of using heat from shallow aquifers;
- other techniques to reduce pressures on the existing status of the aqueous environment in the area of influence where a geothermal heat source is used.

The provided general mitigation measures for attaining the objective (4) ‘Preserve or ensure a good quantitative and chemical status of groundwater’ must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) as well as during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[VD15] Groundwater recharge: This indicator is expressed as annual groundwater recharge of shallow aquifers in a hydrological year (1 November–31 October) in all groundwater bodies for the entire territory of the Republic of Slovenia.

-[VD11] Groundwater quality: this indicator presents the assessment of the chemical status of groundwater. Based on the monitoring data, the chemical status of groundwater bodies is assessed every year, while assessments in six-year water management reporting periods are also conducted. Upward or downward trends in measured values of chemical parameters are also monitored.

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

Guidelines for energy networks do not have an impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to the priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

Guidelines for protecting and supplying raw mineral materials have an insignificant impact on the preservation or provision of good quantitative and chemical status of groundwater (grade B).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide

ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for rural development, agriculture, forestry and fisheries do not have an impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities do not have a direct impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters have a positive impact on the preservation or provision of a good quantitative and chemical status of groundwater (grade A).*

Environmental objective 5: Ensure a good status of the marine environment

Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines in particular have an impact on the preservation or provision of a good status of the marine environment:

- settlements are planned primarily through renovation and internal development within the area of existing settlements, reducing the need for their expansion;
- further expansion of individual settlements is prevented, only existing individual settlements outside of endangered areas are preserved;
- withdrawing settlements and infrastructure from endangered areas;
- including water and waterside areas in green belts between settlements, which are part of the settlement's green system related to the green system of a region;
- preventing turning green areas into car parks;
- areas earmarked for long-term development must not increase the vulnerability of the space in the wider area of a settlement (they must not degrade flood safety or affect natural overflow areas).

Impact of the guidelines for planning and developing settlements on the provision of a good status of the marine environment: on the basis of Decision No 1600/2002/EC laying down the Sixth Community Environment Action Programme, the European Commission drafted the Thematic Strategy on the Protection and Conservation of the Marine Environment with the overall aim of promoting sustainable use of the seas and conserving marine ecosystems⁴⁰. The objective of the Strategy is to protect and restore Europe's oceans and seas and ensure that human activities are carried out in a sustainable manner so that current and future generations are able to enjoy and benefit from biologically diverse and dynamic oceans and seas that are safe, clean, healthy and productive. To attain the objective of the Strategy, Marine Strategy Framework Directive 2008/56/EC was proposed and adopted in 2008. To attain a good environmental status of European seas by 2021, Directive 2008/56/EC imposes on Member States to take suitable measures to attain or preserve a good status of the marine environment.

Measures to be developed and implemented by Member States in accordance with Directive 2008/56/EC include:

- carry out an initial assessment of their marine waters;
- determine a good status of the marine environment;
- determine environmental target values;
- establish and implement coordinated monitoring programmes; and
- define measures to be adopted to attain or preserve a good status of the marine environment.

The approach of Directive 2007/60/EC is based on an ecosystem-based approach to managing human activities, which considers humans and their activities as part of natural ecosystems. The basis of the approach is seeking balance between human activities and limitation to the use of natural resources required for the long-term operation of natural systems and the preservation of their integrity. Only this type of integrated approach includes **sustainable development elements**, and combines environmental, social and economic aspects of management.

⁴⁰ COM(2005)504 final; Communication from the Commission; Thematic Strategy on the Protection and Conservation of the Marine Environment.

The status of the marine environment is outlined with 11 descriptors⁴¹. The descriptors are as follows: biodiversity, non-indigenous species, fish stock (commercial fish species), elements of the marine food webs, eutrophication, sea-floor integrity, hydrographical conditions, environmental pollution, contaminants in fish and other seafood, underwater noise, and marine litter. Criteria and indicators are prescribed for each descriptor. Starting points are provided at the level of the European Community with Commission Decision on criteria and methodological standards on a good environmental status of marine waters (2010/477/EU).

Directive 2008/56/EC imposes on Member States to draft a marine environment management plan and implement its measures to:

- protect and maintain the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected;
- prevent and reduce inputs in the marine environment, with a view to phasing out pollution, so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.

Pollution here refers to the direct or indirect introduction into the marine environment, as a result of human activity, of substances or energy, including human-induced marine underwater noise. Legitimate uses of the sea include marine activities, including fishing, maritime transport, tourism and recreations, and others.

To manage its marine environment, Slovenia adopted the *2017–2021 Marine Environment Management Plan* in 2017. The main section of this plan is a programme of measures to attain and preserve a good status of the marine environment. The programme of measures refers to the 11 quality descriptors used to outline the state of the environment, which is in accordance with the recommendations and requirements arising from the obligation to implement Marine Strategy Framework Directive 2008/56/EC.

The programme of measures addresses activities that give rise to various pressures and impacts on the status of the marine environment due to:

- the pollution of the marine environment with pollutants from sources on land and in the sea, litter, pathogenic microbes, potential oil spills as a result of accidents at sea, diffuse pollution due to agricultural activity;
- the pollution of the marine environment by the introduction of non-indigenous species, over-fishing, and the introduction of nutrients;
- activities/interventions that bring about the physical loss of natural areas in the riparian zone and physical damage to the seabed;
- activities/interventions that raise the underwater noise level.

Guidelines for planning and developing settlements directly or indirectly contribute to the implementation of measures referred to in the *2017–2021 Marine Environment Management Plan*, contributing to relieving pressures on the state of the marine environment.

Guidelines for planning and developing settlements have a positive impact on the provision of a good status of the marine environment (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Urban development of towns and other urban settlements is crucial for the improvement of the economic, social and environmental efficiency of the state. Urban settlements are the most important

⁴¹ Marine Environment Management Plan – Description of a good status of the marine environment and environmental objectives, April 2013.

elements in urban development, where the population density increases with renovations or expansions. Increased environmental pollution in the coastal area due to high building and population density in this area constitutes a negative impact on the preservation of provision of a good status of the marine environment. Residential areas, areas for social infrastructure and areas for the needs of the economy are provided in the coastal area, as a priority, by renovating existing, urbanised and degraded areas (densification of urban structure), making the impact of the pressure of developments on water and coastal land negligible.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of a good status of the marine environment apply to the descriptions and impact assessments of the guidelines for urban development on the provision of a good status of the marine environment. Guidelines for urban development contribute to reduced pressure on the status of the marine environment.

Guidelines for urban development have a positive impact on the provision of a good status of the marine environment (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines in particular have an impact on the preservation or provision of a good status of the marine environment:

- priority development of agriculture, forestry and related activities, while taking into account development trends aimed at the modernisation of these activities and the utilisation of natural resources;
- enhancing the use of renewable energy sources for local development and providing suitable support infrastructure, while taking into account limitations to preserve spatial identity, the recognisability of settlements and the landscape or biodiversity;
- promoting the diversification of economic activities related to agriculture, and a suitable level of transport connections and accessibility to preserve the settlement and vitality of rural areas;
- withdrawing settlements and infrastructure from endangered areas;
- adjusting natural resource management to options for natural restoration;
- comprehensive planning of agricultural spaces, while taking into account potentials for various types of agricultural production, and guidelines for preserving ecological connectivity, protecting habitats and waters as well as recognisable landscape features;
- guiding agriculture towards organic farming in environmentally sensitive areas, protected areas and in the vicinity of settlements;
- preparing innovative solutions to discharge waste water in karst areas;
- water management planning generally follows sustainable plans with natural and available materials nearby;

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of a good status of the marine environment apply to the descriptions and impact assessments of the guidelines for rural development on the provision of a good status of the marine environment. Guidelines for rural development contribute to reduced pressure on the status of the marine environment.

Guidelines for rural development have a positive impact on the provision of a good status of the marine environment (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The following guidelines in particular have an impact on the preservation or provision of a good quantitative and chemical status of surface waters:

- adapting to climate change by preserving overflow areas/floodplains within the green system of regions;
- including forest, agricultural, water areas and other open spaces (flood/overflow areas, safeguard zones) in the green system of a region.

In the marine environment, green infrastructure contributes to the implementation of existing strategies for maritime spatial planning and integrated management of coastal areas⁴², particularly strategies for sustainable management of coastal areas and improving the effectiveness of coastal defence. Applying principles of green infrastructure, which promote various ecosystem services in the marine environment, may be useful for further development of approaches with blue carbon⁴³ beneficial to fish stocks.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of good status of the marine environment apply to the descriptions and impact assessments of the guidelines for green infrastructure at regional and local levels on the provision of good status of the marine environment. Guidelines for green infrastructure at regional and local levels contribute to reduced pressure on the status of the marine environment.

Guidelines for green infrastructure at regional and local levels have a positive impact on provision of a good status of the marine environment (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of a good status of the marine environment apply to the descriptions and impact assessments of the guidelines for special areas and regions on the provision of a good status of the marine environment.

1.5.1 Guidelines for developing the sea and coast

The following guidelines in particular have an impact on the preservation or provision of a good status of the marine environment:

- limiting surfaces for activities that pollute the environment (discharges of waste water, oil, lubricant);
- seeking alternative solutions for activities that may be carried out away from the sea and coast;
- including activities to adapt to climate change in development strategies of the coast or tourism in the coastal area, particularly the adaptation of settlement areas to sea level rise, more droughts, lack of drinking water and water for business, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services;
- establishing a coastal area along the length of the coast intended to conserve nature/preserve natural habitats and landscape, natural resources and ecosystems, for ecological connections between inland areas and the sea, and the adaptation to climate change.

⁴² Directive 2014/89/EU establishing a framework for maritime spatial planning.

⁴³ <http://thebluecarboninitiative.org/>; blue carbon is carbon stored in coastal and marine ecosystems. The Blue Carbon Initiative is currently focused on carbon in the coastal ecosystems of mangroves, marshes and seagrass. These ecosystems sequester and store significant amounts of blue carbon in plants and sediment.

Guidelines for developing the sea and coast contribute to the provision of a good status of the marine environment.

1.5.2 Guidelines for tourist areas

The following guidelines in particular have an impact on the preservation or provision of a good status of the marine environment:

- tourism development either through infrastructure or visits must not put resources and their quality at risk or irreversibly change them;
- supporting sustainable tourism development that is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility;
- tourism development does not open new areas for tourism, particularly not in naturally preserved areas and quiet natural areas, and in endangered, sensitive or water-scarce areas;
- focusing further development of the existing tourist infrastructure on unburdening, reconstructing and modernising existing tourist capacities in terms of increased quality of accommodations, services and programmes, reduced water consumption and waste, and improved infrastructure and services for sustainable mobility;
- providing common public infrastructure in tourist areas in open spaces that are attractive for providers and users (e.g. rivers), which will facilitate organised use along with conditions to preserve nature and waters, and protect the soil;
- promoting the restoration of tourist facilities or innovative accommodation solutions in remote (mountain) and border areas that are self-sustaining in terms of use;
- defining and harmonising the potentials of Slovenian rivers, lakes and anthropogenic lakes for various purposes, and limitations within regional spatial plans;
- tourism in towns brings increased consumption of natural resources (water supply, water discharge, waste, food, passenger transport).

Guidelines for tourist areas contribute to reduced pressure on the status of the marine environment as a consequence of further tourism development.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

Guidelines for preserving and improving the recognisability of settlements and the landscape do not have an impact on the provision of a good status of the marine environment or the impact of these guidelines is positive.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

Guidelines for nature protection areas and cultural heritage areas do not have an impact on the attainment of a good status of the marine environment or the impact of these guidelines is positive.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

Guidelines for providing spatial capacities for a low-carbon society have direct and indirect positive impacts on the provision of a good status of the marine environment, as they promote:

- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The comprehensive assessment of the guidelines for special areas and regions on the provision of a good status of the marine environment: the guidelines for special areas and regions have a positive impact (grade A) on the provision of a good status of the marine environment.

Set 2 of the guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

Guidelines include the guidelines for developing transport infrastructure and services on it, which supports the development of the polycentric urban system and the inclusion of the state in international traffic flows. Guidelines included in this group address specifically:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, are developed in accordance with the polycentric urban system in Slovenia;
- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and the adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling, and the use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes that connect urban centres and tourist settlements, and are connected to the long-distance European cycling connections that run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics), which are connected to centres at levels I and II or to wider urban areas and other areas for functional integration;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of a good status of the marine environment apply to the descriptions and impact assessments of the guidelines for developing transport infrastructure on the provision of a good status of the marine environment. Guidelines for developing transport infrastructure ensure reduced pressure on the marine environment and indirectly contribute to the provision of a good status of the marine environment.

Guidelines for developing transport infrastructure have a positive impact on the provision of a good status of the marine environment (grade A).

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of the guidelines for planning and developing settlements on the provision of a good status of the marine environment apply to the descriptions and impact assessments of the guidelines for developing energy infrastructure to support the transition to a low-carbon society on the provision of a good status of the

marine environment. Guidelines for developing energy infrastructure to support the transition to a low-carbon society indirectly contribute to the provision of a good status of the marine environment.

Guidelines for developing energy infrastructure to support the transition to a low-carbon society do not have a direct impact on the provision of a good status of the marine environment (grade A).

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

Guidelines for energy networks do not have a direct impact on the provision of a good status of the marine environment (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

Guidelines for protecting and supplying raw mineral materials do not have a direct impact on the provision of a good status of the marine environment (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for protecting and supplying raw mineral materials do not have a direct impact on the provision of good status of the marine environment (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development,

particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on the provision of a good status of the marine environment (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account the guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the provision of a good status of the marine environment (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities do not have a direct impact on the provision of a good status of the marine environment (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters have a positive impact on the provision of a good status of the marine environment (grade A).*

Indicators for status monitoring are equal to the indicators listed in Chapter X of the 2017–2021 *Marine Environment Management Plan* as ‘INDICATORS FOR MONITORING THE EFFECTIVENESS OF IMPLEMENTING THE PLAN’S PROGRAMME OF MEASURES’.

7.2.4 NATURE

Environmental objective 6: Protect and preserve biodiversity

Environmental objective 7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected

Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines in particular will have an impact on the environmental objectives:

- settlements are planned primarily through renovation and internal development within the area of existing settlements together with new mobility, energy supply, and other resources, reducing the need for their expansion;
- further expansion of individual settlements is prevented;
- establishing separative green belts to *support ecological connectivity* as part of the settlement's green system related to the green system of a region, which include forests, water and waterside areas and extensively used agricultural land, and *nature protection areas* where permanent interventions are not carried out;
- priority arrangement of rural settlements with the reconstruction and internal development of settlements, while taking into account guidelines on cultural heritage and environmental protection, and the recognisability of settlements and the landscape;
- priority siting of economic, production of other economic activities within the internal development of settlements or the restructuring of degraded areas or areas of existing economic and business zones;
- priority siting of new shopping centres in degraded areas of urban settlements or land that may be used for this purpose within the internal development of settlements;
- preventing turning green areas into car parks.

Interventions in the natural environment, particularly the siting of new buildings, activities, and infrastructure, mean a permanent loss of habitat, and have a negative impact on the natural distribution of habitat types, and habitats of plant and animal species, their quality and integration of habitats of populations, which may also affect biodiversity. If interventions are carried out in areas with a nature protection status, impacts can be particularly extensive or even destructive, as they may permanently degrade the level of nature conservation and the protection objectives for protected areas, Natura 2000 sites, IEAs, and valuable natural features. Special attention must be paid if interventions are carried out in protected areas where a permanent loss of surfaces of qualifying and key HT and habitats of species may occur, impacting the integrity, functionality, and cohesion of areas. Permanent and direct impacts on the characteristic of a valuable natural feature and its type due to which the feature has been declared is also possible. Particularly sensitive are also areas of watercourses and other water areas. The SDSS guidelines are designed so as to lessen the impact on biodiversity as much as possible. Arranging settlements with the reconstruction of existing settlements, preventing further expansion of settlements, and priority siting of activities in degraded areas will contribute to reducing impacts of settlement development on biodiversity and areas with a nature protection status. The establishment of the settlement's green system related to the green system of a region, which may include nature protection areas, will have a positive impact on the preservation of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected, and consequently, on biodiversity, facilitating ecological connectivity. Better infrastructure, type and volume of green areas in settlements, and preventing green areas from being turned into car parks will also have a positive impact. To reduce negative impacts, general mitigation measures must be taken into account to additionally reduce negative impacts on the environmental objectives.

The impact of arranging and developing settlements on the environmental objectives is assessed as insignificant due to the implementation of mitigation measures (grade C).

General mitigation measures of the guidelines for planning and developing settlements to attain the objectives to protect and preserve biodiversity, and preserve the integrity of areas with a nature protection status:

As foreseen in the substance of the SDSS, urban development should be prioritised in existing urban and degraded areas; however, if the development of untouched areas cannot be avoided, the following should be taken into consideration:

- When siting infrastructure for urban development, the integration of facilities in areas of valuable natural features must be avoided. Consideration of the guideline will facilitate the preservation of types and characteristics of valuable natural features.
- When siting infrastructure for urban development, it is necessary to avoid the siting of facilities in protected areas. If the interventions cannot be avoided and if this is permitted under the act on the

protection of an individual area, it is necessary to observe the guidelines, starting points, and conditions for nature protection in areas that are under protection regimes adopted in acts on protection. Consideration of the guideline will facilitate the protection of protected areas.

- When siting infrastructure for urban development, it is necessary to avoid placing facilities in Natura 2000 areas. Consideration of the guideline will facilitate protection of the connection and integration of Natura 2000 sites. If interventions are inevitable, interventions and activities must be planned in accordance with the Decree on special protection areas (Natura 2000 areas) (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 49/04, 110/04, 59/07, 43/08, 8/12, 33/13, 35/13 – amend., 39/13 – Constitutional Court Decision, 3/14, 21/16, 47/18) to preserve ecological structures, functions, and protection potential.

Pursuant to the Resolution on National Environmental Action Plan 2005–2012 (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 2/06): “The increase in the proportion of protected areas in various categories by 10 per cent to 22 per cent of Slovenia’s surface area by 2014”, which has not yet been realised, an increase in the scope of protected areas is to be expected in the years to come. Therefore, the siting of infrastructure in areas proposed for protection should be avoided in order to prevent possible conflicts and negative impacts on attaining the environmental objectives of nature conservation.

Infrastructure should not be sited on coastal land. Such activities may significantly impact the ecological status of watercourses, reduce retention areas, and produce cumulative impacts on the biodiversity of the area and ecosystem services of the area. According to Article 37 of the Water Act, an exception is possible only on the basis of expert argumentation stating that the facility cannot be sited elsewhere without disproportionately high costs. Also, the costs of reducing ecosystem services in the case of interventions in the coastal area have to be included in the cost calculation. The observance of the aforementioned guideline will make the calculation of costs more concrete and adequately balanced. Less siting in the coastal area is anticipated, which will prevent significant negative impacts on the biodiversity of the coastal area.

The provided general mitigation measures for attaining the objectives (6) ‘Protect and preserve biodiversity’ and (7) ‘Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected’ must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **change in the conservation status of species and habitat types** from the report as per Article 17 of the Habitats Directive (92/43/EEC);
- **change in the conservation status of species in the SPA areas and on the territory of the whole Slovenia** from the report as per Article 12 of the Directive on the conservation of wild birds (79/409/EEC);
- spatial data (digital layer) for areas with a nature protection status.

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The following guidelines in particular will have an impact on the environmental objectives:

- during reconstructions and expansions, urban settlements must have sufficient public green areas, and the exclusive use of space must be limited;

- priority provision of residential areas, social infrastructure areas, and areas for the needs of the economy by reconstruction existing, urbanised and degraded areas.

In addition to priority provision of residential areas, social infrastructure areas, and areas for the needs of the economy in urban areas by reconstruction existing, urbanised and degraded, areas, urban development foresees the siting of new (infrastructure) facilities and new activities, whereby expansion may interfere with areas with a nature protection status, having an impact on biodiversity of these areas. Urban development increases population density, and consequently, pressures on surface water (increased quantity of waste water) and groundwater (increased needs for drinking water), which may indirectly affect areas with a nature protection status and biodiversity. The impact is also reflected in disturbances and changes in habitats of wild animals due to human presence (indirect impact), and the loss of habitats (direct impact), which is the result of the arrangement of residential areas and the required infrastructure. Infrastructure siting in the immediate vicinity of surface waters may have a particularly significant impact. Larger green areas, which may act as corridors between natural areas, will have a positive impact on the environmental objectives. To reduce negative impacts, mitigation measures must be taken into account to additionally reduce negative impacts on the environmental objectives.

The impact of urban development on the environmental objectives is assessed as insignificant due to the implementation of mitigation measures (grade C).

To reduce negative impacts, measures prescribed in GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS must be taken into account.

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines in particular will have an impact on the environmental objectives:

- taking into account limitations to *preserve biodiversity*, spatial identity or the recognisability of settlements and the landscape supports the use of renewable energy sources and the provision of support infrastructure;
- guiding and priority connecting the development of agricultural and forest activity with development options of *nature protection areas* and cultural heritage;
- focus on socially acceptable balance between the preservation of wild animal species as well as agriculture, forestry, and life in mountain and remote rural areas;
- *preserving ecological connectivity*, regional and local identity, and the recognisability of settlements and the landscape during interventions in space, activities in rural areas, and constructions to improve the quality of the living environment;
- natural resource (are, the soil, forests, water) management to adapt to options for *natural restoration*;
- the role of green systems in settlements, and suitable relation to green systems of a regions is strengthening;
- agricultural space is planned comprehensively, while taking into account potentials for various types of agricultural production, and guidelines for *preserving ecological connectivity, protecting habitats and waters*, and recognisable landscape features;
- guiding agriculture towards organic farming in environmentally sensitive areas, protected areas, and in the vicinity of settlements;
- preventing overgrowth and preserving the productivity of agricultural land to limit the reduction of its size;
- preserving patches of forest land in flat areas that are important for *ecological connectivity and passages for wild animals, biodiversity*, the mitigation of climate change or as elements with landscape structural value;

- including forests in green systems of regions and towns to *provide ecological corridors*, for recreational use, and the mitigation of climate change, whereby conflicting forms of recreations are limiter or suitable guided;
- priority preservation of forest areas in agricultural flat areas, which significantly contribute to the quality of surface or rain water or to the purification of waters from agricultural land or to the mitigation of impacts of the use of plant protection products on agricultural land;
- preserving ecological and protection functions of the forest;
- siting wood processing plants and arranging access to plants and large logistic centres;
- water must be used with considerable concern for the recharging and long-term protection of aquifers, as water is crucial for the functioning of natural ecosystems and biodiversity;
- devising innovative solutions for water supply and waste discharge in karst areas with a low soil self-cleaning ability, karstic floods and occasional or frequent water scarcity;
- priority pursuit of options for complementary uses in safeguard zones or uses that *preserve the quality of a water resource*;
- regarding the use of raw mineral materials, the goal is to optimise acquisition and gradual closing of small buildings and to restore illegal pits by priority restoration of pits in nature protection areas by *re-establishing the natural status or secondary biotope*;
- in protected areas, locations to utilise rare and unique raw mineral materials, e.g. granite, tonalite, and marble, are admissible if interventions include occasional removal intended for cultural heritage restoration.

Guidelines for rural development promote the development of agriculture, forestry and related activities, while sustainably managing natural resources, preserving the settlement of mountain and remote areas, improving transport connections and accessibility, providing infrastructure and publicly significant services, and improving the quality of the living environment.

Since guidelines for rural development are based on priority reconstruction and internal development of rural settlements, and the prevention of individual settlement, major impact is not expected. Other interventions, particularly the siting of new activities and infrastructure, may have a negative impact on the preservation of the integrity of areas with a nature protection status, which, however, is insignificant if the requirements and restrictions of protection regimes are taken into account, and with the foreseen preservation of the recognisability of settlement and the landscape, and ecological connectivity, and better status of the environment.

The development of activities, particularly agriculture and forestry, along with sustainable use of natural resources are also important for rural development. The planning of agricultural space while taking into account potentials for various types of agricultural production, and guidelines for preserving ecological connectivity, protecting habitats and waters and recognisable landscape features, will have a positive impact. Priority development of agricultural holdings within existing rural settlements and villages will also have a positive impact, reducing possibilities of interventions in areas with a nature protection status, and impact on biodiversity as well as the inclusion of agricultural land in green systems of settlements and regions. Negative impact may be expected due to an increased need for cultivated land, which may result in turning meadows into fields, destroying the ecosystems of the agricultural landscape that is rich in species. Special attention will have to be paid to agricultural holdings whose land is located in areas with a nature protection status, and to specific agricultural measures, such as irrigation systems and agromelioration, which may interfere with areas with a nature protection status, and whose consequences are changed properties of the soil and a changed water regime, which may reduce the presence of rare and endangered species and priority habitat types due to which an area is protected.

Priority preservation of dense forest stands and forest areas in agricultural flat areas, the adaptation of forest management in these areas, and the inclusion of forest areas in green systems of regions will have a positive impact, supporting ecological connectivity. The restriction of activities in forests that bring about a changed status of forests and natural resource quality will also have a positive impact. The siting of wood production plants and the arrangement of accessibility (forest roads), which may

interfere with the integrity of areas with a nature protection status, and potentially increased felling and skidding may have a negative impact on forest ecosystems and biodiversity.

Regarding the use of raw mineral materials, the priority restoration of pits that have a negative impact on the environment, and pits located in nature protection areas will have a positive impact. The guideline that allows the utilisation of rare and unique raw mineral materials has a positive impact on preserving the characteristics and processes of areas with a nature protection status only if this includes occasional removal intended for cultural heritage restoration.

A joint impact of guidelines for arranging rural areas on the environmental objectives is assessed as insignificant (grade B).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The green system of a region provides for the multi-functionality of space at the regional level, particularly for the ecological and environmental function, and compatible use of space, the preservation or improvement of a favourable status of habitats in Natura 2000 areas, the adaptation to climate change, particularly by preserving overflow areas/floodplains, the natural restoration of natural ecosystems, particularly the soil and forests, the recognisability of the landscape, and outdoor recreation. A plan for the green system of a region provides connections with other regional green systems and green systems of settlements, defining existing landscape elements to provide ecological connections between ecosystems, the conditions for their preservation, and guidelines for establishing the missing connectivity. The green system of a region preserves and improves a favourable status of habitats in areas with a nature protection status, natural restoration of natural ecosystems, particularly the soil and forests, and preserves biodiversity.

Since regional green systems and green systems of settlements include protected areas, and green infrastructure provides ecological connectivity of ecosystems and the conditions for their preservations, and the planning of infrastructure and spatial arrangements must adapt to the requirements to preserve ecological connectivity, the impact on the protection and preservation of biodiversity, and the preservation of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected is assessed as *positive (grade A)*.

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and coast

The following guidelines in particular will have an impact on the environmental objectives:

- preserving open undeveloped space for green infrastructure functionally connected to marine and wider land, and the green systems of coastal towns and region;
- carrying out activities exclusively related to the sea or the point where the sea touches the coast, which must be harmonised in terms of space and scope in a way that will preserve the productive sea and a healthy coast in the long term;
- limiting surfaces for activities that pollute the environment (discharges of waste water, oil, lubricant);
- establishing a coastal area along the length of the coast where construction is not permitted and that is intended to conserve nature/preserve natural habitats and landscape, natural resources and ecosystems, for ecological connections between inland areas and the sea, and the adaptation to climate change.

The coast is highly urbanised and densely populated, and multifunctional with major transport significance, while also an important area with a nature protection status.

Characteristic of the Slovenian coast are dense population, partly intensive agriculture, industry, tourism, and service activities, which affects the quantity of municipal and industrial waste water flowing into the sea, and may affect ecological processes, and consequently the status of the sea. Urban development of coastal towns will bring about higher quantities of waste water, whose impact on the characteristics and processes in nature protection areas and biodiversity will be insignificant if the SDSS guidelines for limiting surfaces for activities that pollute the environment are taken into account.

The development of the port of Koper, increased maritime transport, and activities related to the sea and coast will have a negative impact on the characteristics and processes in nature protection areas, and biodiversity, increasing the pollution of the sea and coastal environment (oil, petroleum oil, lubricants). The planned limitations to surfaces for activities that pollute the environment and measures stipulated in implementing acts will make this impact insignificant.

The establishment of a coastal area along the length of the coast where construction is not permitted and that is intended to conserve nature/preserve natural habitats and landscape, natural resources and ecosystems, for ecological connections between inland areas and the sea, and the adaptation to climate change, and is part of green systems of coastal towns and region will have a positive impact. The preservation of an open undeveloped space for green infrastructure when developing coastal settlements, which will be functionally connected to marine and wider land, and the green systems of coastal towns and region, will also have a positive impact.

1.5.2 Guidelines for tourist areas

The following guidelines in particular will have an impact on the environmental objectives:

- tourism development either through infrastructure or visits must not put resources and their quality at risk or irreversibly change them; natural restoration of ecosystems in particular must be ensured;
- tourism development does not open new areas for tourism, particularly not in naturally preserved areas and quiet natural areas or in endangered, sensitive or water-scarce areas;
- providing common public infrastructure in tourist areas in an open space, which will facilitate organised use along with conditions to preserve nature, cultural heritage, and water and soil;
- harmonising tourist programmes and developing tourism in protected areas (nature parks and other protected areas) with protection objectives in individual areas;
- the contribution of tourism in remote (mountain) and border areas to the preservation of settlement, and indirectly to the preservation of nature and the cultural landscape.

Sustainable tourism development based on connections between nature conservation, prudent utilisation of environmental resources, and their long-term preservation, and the promotion and establishment of sustainable mobility are supported. The prevention of opening new areas for tourism, particularly of expansion in naturally preserved areas, and focus on the development of tourist infrastructure on areas where crucial tourist infrastructure has been provided will have a positive impact on the preservation of biodiversity, and the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected.

The harmonisation of tourist programmes and developing tourism in protected areas with protection objectives in individual areas, which reduce the impact of planned development on areas with a nature protection status and the biodiversity in these areas, will also have a positive impact on the environmental objectives.

More tourists in areas, which will increase the use of natural resources and services, will have an indirect negative impact. The negative impact of more tourists is also reflected in increased quantities of waste, waste water discharge, and increased traffic and noise. If the SDSS guidelines are taken into account, the impact will not be significant.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

The recognisability of space is a characteristic of space that stems from physical, cultural, and natural features, and is the result of respectful and prudent settlement and landscape arrangement, and inherited values of society.

The preservation of open undeveloped space between settlements, and the preservation or new establishment of recognisable landscape elements during siting, the distribution of individual activities, land operations or the arrangement of agricultural, forest or water areas will have a positive impact on the environmental objectives.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

According to SDSS, protected areas are areas of nature with considerable biodiversity, abiotic and landscape diversity, and high density and diversity of valuable natural features, and are a crucial instrument in nature conservation. The guidelines include general guidelines for nature protection areas and cultural heritage areas and cultural heritage areas, i.e. guidelines for activities in these areas, and development guidelines.

On the basis of the SDSS guidelines, activities in areas with a nature protection status, and areas with considerable biodiversity will be carried out in a way that support the attainment of protection objectives. Protected areas will be developed in view of protection objectives, and the needs of local development and other activities.

1.5.5 Guidelines for providing spatial capacities for low-carbon society

The following guidelines in particular will have an impact on the environmental objectives:

- greater energy efficiency when developing and reconstructing urban and rural settlements and villages, transport, industry and the business sector, tourism, agriculture, public administration, and households is promoted as a priority for the transition to a low-carbon society. Energy-efficient urban planning supported with sustainable mobility, architectural design, and smart energy systems is used to reduce energy consumption, increase energy efficiency and the rational use of energy, and its storage;
- siting facilities for the production of renewable energy sources in areas where potentials may be utilised most optimally, i.e. by taking into account restrictions to preserve habitats, valuable natural features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features.

Greater energy efficiency will reduce pressure on areas with a nature protection status and areas with more considerable biodiversity, as the need for new electricity generation facilities will also be reduced. The siting of facilities for the production of renewable energy sources outside areas important for nature conservation is appropriate.

The comprehensive assessment of guidelines for special areas and regions on the protection and preservation of biodiversity, and the preservation of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected: guidelines for special areas and regions have a positive impact (grade A) on the environmental objectives.

Set 2 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The following guidelines in particular will have an impact on the environmental objectives:

- developing transport infrastructure in relation to the planned spatial development in individual areas (urban, remote and mountain, rural, etc.);
- promoting intermodal transport connection with pertaining intermodal infrastructure, railway network development;
- promoting sustainable mobility while reducing traffic and adverse effects of traffic on the environment;
- adapting public passenger infrastructure to the typology and characteristics of space to preserve the recognisable settlement and landscape features, prevent space fragmentation, and reduce negative impacts of transport on the environment and human health;
- setting up a cycling network for daily migrations into towns and other urban settlements, in wider urban areas, and other areas for functional integration;
- setting up a footpath network in tourist areas in relation to the cycling network;
- selecting a combination of transport subsystems that facilitate safe, affordable, and environmentally neutral form of mobility and connectivity.

Greater sustainable mobility while reducing traffic will have a positive impact on the environmental objectives, as it will relieve pressure on areas with a nature protection status and considerable biodiversity.

Impacts on areas with a nature protection status and biodiversity are possible during and after the period of construction or reconstruction of transport infrastructure. They are mostly observed in the local environment, while in the event of extensive interventions, they may also be felt regionally and across the border (for example, the impact on the cohesion and integrity of the Natura 2000 network). During the construction or reconstruction of transport infrastructure, impacts are mostly short-term and reversible (for example, noise pollution of the construction site area, murky watercourses). After construction, impacts are mainly permanent and irreversible due to the changed use of land (for example, increased noise pollution from transport, obstacles in the environment, destruction of a habitat of a qualifying species, etc.). Special attention must be paid if infrastructure facilities are sited in protected areas where a permanent loss of surfaces of qualifying and key HT and habitats of species, and impact on the integrity, functionality, and cohesion of areas may occur. Since a large part of Slovenian territory has been defined as an area with nature protection status, there is a significant probability that new construction in road and rail transport will interfere with these areas. Most significant impacts are expected during interventions in road and railway networks.

The impact of guidelines for developing transport infrastructure to on the preservation of biodiversity, and the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected is assessed as insignificant due to the implementation of mitigation measures if the phase of planning and adopting plans and projects takes into account all required mitigation measures and restrictions of protection regimes in areas that will support the preservation of integrity, characteristics and processes (grade C).

To reduce negative impacts, measures prescribed in the GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS in Set 1 (Guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development) must be taken into account.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

In general, the impact of measures for the transition to renewable and low-carbon energy sources on the environmental objectives is positive. The use of fossil fuels has been reduced, which in turn

reduced environmental pollution with greenhouse gas emissions and other emissions into the air. The transition to renewable energy sources reduces the probability of climate change, which is currently the greatest threat to the natural environment. Special attention must be paid to the siting of buildings for the utilisation of renewable and low-carbon energy sources, and pertaining infrastructure.

HYDROPOWER

The following guidelines in particular have an impact on the environmental objectives:

- priority utilisation of existing energy facilities for modernisation with state-of-the-art technology to obtain or utilise the additional potential of renewable energy sources, improve energy efficiency, and reduce the environmental impacts of such facilities, while providing flood safety, preserving and improving ecological connectivity, recharging aquifers, preserving human health, and preserving nature and cultural heritage;
- the planned chain of hydro power plants from Jevnica to Suhadol in the middle section of the Sava River is to be verified and harmonised with the requirements for water and waterside habitats, waters, and ecological connectivity, while in the lower section of the Sava River, the section between Brežice and Mokrice constitutes hydropower potential;
- using individual watercourses or their sections for hydropower with small hydro power plants, and verifying utilisable hydropower potential, spatial capacities for the use of existing barriers, the requirements for the protection of water and waterside habitats, water protection, ecological connectivity, and the preservation of the recognisability of the landscape.

Priority utilisation of existing energy facilities for modernisation with state-of-the-art technology and better energy efficiency will have a positive impact on the environmental objectives of nature conservation, as it will reduce the need for setting up new hydro power plants. The siting of new hydro power plants may have a negative impact on the preservation of biodiversity, particularly due to the loss of habitat species and habitat types in water and waterside ecosystems, the interruption of migration routes by obstacles in watercourses, changes in sedimentary activity, deterioration in the chemical status of water, changes in the stream regime, and changes in flooding dynamics. Additional impact is possible due to the occupation of land when constructing mandatory pertaining infrastructure. Impact on the environmental objectives of nature conservation is particularly significant when siting facilities in areas with a nature protection status and areas with considerable biodiversity.⁴⁴

WIND POWER

The following guidelines in particular have an impact on the environmental objectives:

- constructing small wind, small, medium or large wind farms, while taking into account wind potential, nature vulnerability, and recognised landscape features, and distance from settlements.

The SDSS guideline to use the best and most efficient technology to utilise wind power and the take nature vulnerability into account during siting is suitable from the aspect of the impact on nature. In addition, the guideline to site small and micro power plants in settlements as a priority is positive. Nevertheless, each siting of a new wind farm has negative impacts on nature. By installed power, small and large wind farms may also have an impact. It was established that adverse effects of individual wind turbines are minor, and the impact is usually locally limited. Wind farms with multiple wind turbines usually have more significant (cumulative or even synergic) and remote

⁴⁴ Note regarding the impact assessment of large HPP: Individual construction projects were not assessed, and will have to be assessed at the next level. The impact of certain projects may be assessed as significant, which means that they will not be realised or will be only partially realised even after the implementation of procedures of prevailing another public interest. The adoption of SDSS does not prove prevailing another public interest that will not be established until the exact assessment of individual HPP construction projects has been carried out, while taking into account the absence of other alternative solutions and the possibility to implement suitable compensation measures.

impact. Additional impact is possible due to the occupation of land when constructing mandatory pertaining infrastructure.

Adverse effects of wind farms may affect in particular birds, bats, and large carnivores (wolves, lynx, and bears), i.e. birds and bats due to potential collisions with rotors, bats also because of barotrauma, while large carnivores may be affected by potential fragmentation of dense forest stands and the prevention of migration of more timid carnivores (wolves, lynx). These impacts may directly or indirectly affect smaller populations of certain species or in the case of rare and endangered species, even the loss of an entire population, and therefore, lower biodiversity in the wider area. Due to potentially negative impacts of wind farms on birds, bats, and large carnivores, the correct selection of macro and micro locations (areas of wind farms and locations of individual turbines), it is crucial to disturb these animal groups as little as possible. Wind farms must be set up, planned, and maintained so that they do not cause the preservation status of birds, bats, and large carnivores to deteriorate. Special attention must be paid to the location of wind farms.

GEOTHERMAL ENERGY AND AMBIENT HEAT

The following guidelines in particular have an impact on the environmental objectives:

- ensuring water reinjection in accordance with the guidelines for protecting and managing waters during geothermal energy consumption;
- the whole territory of Slovenia, particularly construction land, is suitable for the utilisation of ambient heat with heat pumps;
- utilising water areas for this purpose is only possible if it is environmentally acceptable.

Addressing technology for the utilisation of geothermal energy usually also addresses direct use of thermal water. Technological processes of geothermal water use differ according to their purpose (balneology, heating, district heating, nurseries) and complexity. The problem in Slovenia is that thermally used water is not returned to aquifers. Used thermal water is usually discharged into surface waters. Increased temperatures affect the populations of aquatic organisms that need small temperature ranges or lower temperatures to live, as they are not able to adapt to new temperature regimes as much as aquatic organisms that can stand greater temperature ranges and whose populations would increase in new conditions. Such a situation provides favourable conditions for the multiplication of indigenous species that are not invasive in usual conditions, but may become extremely competitive in changed conditions. The SDSS guidelines foresee water reinjection in accordance with the guidelines for protecting and managing waters, and utilising water areas only if this is environmentally acceptable, which is suitable.

BIOMASS

The following guidelines in particular have an impact on the environmental objectives:

- priority promotion of the utilisation of biomass in remote energy systems for district heating in wider urban areas and in larger densely populated settlements, and business zones with ensured heat energy consumption, while providing suitable filters for air protection;
- planning decentralised individual systems that utilised wood biomass in small settlements with low population density, outside of areas at risk due to pollution with PM₁₀ particles or with little wind, and in business and production zones;
- priority planning of biogas-fuelled systems in areas intended for agricultural and food production, and municipal infrastructure areas, which may be connected directly to users.

In the long term, the utilisation of wood biomass does not put the sustainable use of forests at risk. Felling is regulated by forestry management plans. Unsuitable interventions in forests may lead to the permanent loss of habitat types and habitats of species, and have a negative impact on the populations of species, their migrations, and biodiversity. Regional units of the Slovenia Forest Service competent for the drafting of forest management plans (FMP) must obtain the opinion of the Institute of the Republic of Slovenia for Nature Conservation on the proposed FMP, which establishes during the revision whether the plan takes into account protection objectives of nature conservation. The result of

the FMP assessment is a plan that foresees management methods for forest areas with a nature protection status, which do not put the populations of species and biodiversity at risk.

The operation of biogas plants produces wet by-products which, in the case of exceptional events (spillage) or permanent defects of, or damage to, facilities (leakage), could leak into the ground or flow into watercourses, having a negative impact on organisms that depend on watercourses. If all of the prescribed standards for the construction and operation of such facilities are taken into account, the probability of such events is low.

If forests are managed sustainably as foreseen in forest management plans harmonised with the Institute of the Republic of Slovenia for Nature Conservation, and if applicable legislation is observed, the impact of biomass utilisation on the protection and preservation of biodiversity will be insignificant.

SOLAR ENERGY

The following guidelines in particular have an impact on the environmental objectives:

- priority areas for the utilisation of solar energy are areas of construction land, particularly roofs and façades of buildings, infrastructure facilities, particularly car parks road and rail corridors, public lighting, and degraded areas as part of their restoration, particularly abandoned areas where raw mineral materials are acquired, disposal facilities, if such restoration is acceptable from the aspect of environment and nature protection, and the preservation of the landscape recognisability.

Negative impacts on the environmental objectives of protecting and preserving biodiversity, and preserving the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected could be possible if solar systems were placed on undeveloped land. However, the SDSS guidelines foresee that areas of construction land are to be used primarily for the consumption of solar energy, and therefore, negative impacts on the environmental objectives are not expected.

The impacts of guidelines for developing energy infrastructure to support the transition to a low-carbon society on the preservation of biodiversity, and the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected are assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for developing energy infrastructure to support the transition to a low-carbon society to attain the objective to protect and preserve biodiversity, and preserve the integrity of areas with a nature protection status:

1. Wind turbines must be set up, planned, and maintained so that they do not cause the preservation status of birds, bats, and large animals to deteriorate. Generally, it is not permitted to site wind farms in the following areas: protected areas, special protection areas or the heart of ecologically significant areas that are a central habitat for large animals. Wind turbine platforms may not be located within ten metres of the entrance of subterranean caves or in the areas above known cave tunnels. As a priority, wind turbines should be placed in potential wind farm areas that do not include areas that are very sensitive for birds.

2. Hydro power plants should be sited so that they do not affect the distinctive features of important nature conservation areas and their biotic diversity (Natura areas, Ramsar areas, IBA, UNESCO areas, ecologically significant areas, natural values, protected areas), so that the conservation of qualification species and habitat types (HT) in Natura 2000 areas is ensured, that aquatic and water-related organisms are preserved, and the preservation of the habitats of protected and endangered species as well as priority HT in the immediate and broader area of the power plants is ensured. The passage and the connectedness of watercourses must be established for fish and other aquatic organisms, and river

dynamics, sedimentary activity, natural ecosystem characteristics of tributaries and their natural structure must be preserved.

General policy: Activities and interventions in Natura 2000 areas (SPA and SCI areas) must be planned pursuant to Article 7 of the Decree on special protection areas (Natural 2000 areas) (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 49/04, 110/04, 59/07, 43/08, 33/13, Constitutional Court Decision – no. 39/13, 3/14, 21/16). It is necessary to carry out assessments of the acceptability of activities in nature pursuant to Article 28 of the Nature Conservation Act (Official Gazette of the Republic of Slovenia [*Uradni list RS*], Nos. 96/04 –ZON-UPB2, 46/14- ZON-C). If an intervention is carried out, all possible technical and other measures must be foreseen and implemented to make the adverse effects on habitat types, plants and animals, and their habitats still acceptable. In particular, the protection objectives defined for each of the Natura 2000 areas must be taken into account. Interventions and activities in protected areas must be conducted in accordance with the instrument regarding protection and management plan, provided that such an instrument exists.

If replacements of natural habitats are required to reduce the results of the impacts on the protection-related goals in Natura 2000 areas, the effects will be significant. In this case, replacement habitats will need to be defined as compensatory measures in the sense of Article 6(4) of the Habitats Directive, provided that the conditions for conducting the procedure for the dominance of other public benefits are met. In the procedure for the dominance of other public benefits over the public benefit of nature preservation, the prevalence of the public benefit of **building a hydro power plant** over the public benefit of nature conservation must be proved after it has been determined that there are no alternative solutions that would be less harmful to nature. When other public benefits do not directly refer to human health and public safety or when they do not have beneficial consequences that would be essential to the environment and priority species or habitat types are present in the area, the opinion of the European Commission must be obtained. The prevalence procedure is carried out provided that the implementation of suitable compensatory measures is possible; in the case of Natura 2000 areas, these measures are the replacement of a destroyed habitat or habitat type with the same substance and scope that would ensure comprehensive compliance and connectedness of the Natura 2000 network.

The provided general mitigation measures for attaining the objectives (6) ‘Protect and preserve biodiversity’ and (7) ‘Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected’ must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **change in the conservation status of species and habitat types** from the report as per Article 17 of the Habitats Directive (92/43/EEC);
- **change in the conservation status of species in the SPA areas and on the territory of the whole Slovenia** from the report as per Article 12 of the Directive on the conservation of wild birds (79/409/EEC);
- spatial data (digital layer) for areas with a nature protection status.

2.3 GUIDELINES FOR ENERGY NETWORKS

The establishment of a TS, power line or cable conduit in areas with a nature protection status constitutes a degradation of the area and has a potential negative impact on birds. In the case of laying electricity cables or building a gas transmission network, there are no impacts on birds (except during construction), although negative impacts on habitat types may remain, especially if the route passes through a dense forest stand, wetland or an important habitat of a plant species.

Adaptations and further development of transmission and distribution networks, and a gas transmission network are planned to run on existing routes of electric and hot-water lines to make the impacts on nature as low as possible if specific mitigation measures are taken into account (grade C).

General mitigation measures of the guidelines for developing energy networks to attain the objectives to protect and preserve biodiversity, and preserve the integrity of areas with a nature protection status:

The siting of power lines results in the degradation of the area and a potentially deadly obstacle for birds, particularly due to injuries that may be caused by colliding onto power line elements or electric shock. When locating power lines, the following guidelines should be taken into account:

- Power lines should avoid special protection areas and important bird areas (IBA) areas, especially if major groups of wintering birds concentrate in such areas, or if the areas they are in are migratory corridors or flight corridors of large birds. If the area cannot be avoided, cabling should be undertaken.
- It is recommended that the planned corridor of power lines is placed outside of protected areas, Natura 2000 areas and sites with natural values, as well as outside dense forest.
- Multiple power lines should be concentrated along the same corridor, or at least along existing infrastructure corridors.

The provided general mitigation measures for attaining the objectives (6) 'Protect and preserve biodiversity' and (7) 'Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicators for status monitoring:

- **change in the conservation status of species and habitat types** from the report as per Article 17 of the Habitats Directive (92/43/EEC);
- **change in the conservation status of species in the SPA areas and on the territory of the whole Slovenia** from the report as per Article 12 of the Directive on the conservation of wild birds (79/409/EEC);
- spatial data (digital layer) for areas with a nature protection status.

2.4 Guidelines for protecting and supplying raw mineral materials

The SDSS guidelines foresee the closing of small facilities for the supply of raw mineral materials, the restoration illegal pits, and increase the use of recycled resources or secondary raw materials. To obtain fine sand, gravel, and sand, the utilisation of fluvial deposits is foreseen, although only when low vulnerability of the water ecosystem and water quality are established. Guidelines foreseen in the SDSS will suitably reduce negative impacts on the environmental objectives for nature.

The impacts of guidelines for protecting and supplying raw mineral materials on the protection and preservation of biodiversity, and the protection of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected are assessed as insignificant (grade B).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

Impact on the environmental objectives for nature are described in greater detail in chapter “1.3 Guidelines for rural development” within “Set 1 – Guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development”.

A joint impact of guidelines for rural development, agriculture, forestry and fisheries on the protection and preservation of biodiversity, and the preservation of integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected is assessed as insignificant (grade B).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS guidelines foresee the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting valuable natural features as part of spatial development. In addition to existing protected areas and harmonised attainment of protection objectives, they foresee the establishment of new protected areas, primarily on the most sensitive areas in terms of nature conservation, which require regimes and attentive management. *The impact of guidelines for nature conservation on the environmental objectives is assessed as positive (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account the guidelines for tourist areas referred to in chapter 1.5.2. *The impacts of guidelines for tourism developing on the protection and preservation of biodiversity, and the preservation of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected are assessed as insignificant (grade B).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

These guidelines foresee priority development of defence activities in areas already used for defence, and gradual reduction of areas for defence activities in urban areas. When planning replacement and new infrastructure for defence activities, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage, and important nature protection areas. *The impact of guidelines for defence activities on the protection and preservation of biodiversity, and the preservation of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected is assessed as insignificant (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *The impact of guidelines for preventive protection against natural and other disasters on the protection and preservation of biodiversity, and the preservation of the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected is assessed as positive (grade A).*

7.2.5 CLIMATE FACTORS

Environmental objective 8: Reduce greenhouse gas emissions
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Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines included in the guidelines for planning and developing settlements in particular have an impact on the reduction of greenhouse gas emissions:

- completely renovating settlements to *reduce carbon footprint* at the level of buildings, neighbourhoods, and settlements, enhance resilience to climate change, and reduce the need for their expansion;
- improving accessibility to services of general importance and services of general economic importance, accessibility of housing and jobs with sustainable mobility and reduced need for mobility;
- improving air quality in settlements by reducing emissions from combustion plants and means of transport, and improving the structure, type and volume of green areas and their maintenance as a means of reducing emissions and improving air quality;
- improving infrastructure and sustainable mobility in rural settlements where tourism is developed;
- priority planning of district heating and building cooling systems with renewable or CO₂ neutral gases in wider urban areas, other areas for functional integration, and more densely populated settlements;
- facilitating the accessibility of all required daily services in residential areas on foot;
- providing good accessibility of social infrastructure areas and employment areas in residential areas with sustainable mobility;
- priority siting of economic and business zones in settlements located near transport hubs by providing good connections particularly with public transport from all areas of a region and neighbouring regions;
- facilitating the accessibility of daily supply areas in urban and rural settlements on foot;
- siting shopping centres within intermodal hubs for passenger transport by connecting at least public rail and bus transport, and promoting access with public transport;
- concentrating urban structures near transport hubs, public passenger transport terminals, and PPT stops, and siting supply and other business activities to PPT hubs and very close to them;
- supporting the expansion of central pedestrian zones, the development of a cycling network and PPT when planning transport areas in towns;
- priority planning of areas for long-term development in areas where good access through public transport and other forms of public transport can be organised, whereby existing options, particularly the railway, are to be used as a priority.

Impacts of guidelines for planning and developing settlements on the reduction of greenhouse gas emissions: The European Union set objectives to gradually reduce greenhouse gas emissions by 2050, among which climate and energy targets for interim period are crucial and determined in:

- the 2020 climate and energy package; and
- the 2030 climate and energy framework.

These climate and energy targets are defined for the European Union to realise the transition to a low-carbon economy as described in more detail in the 2050 long-term strategy⁴⁵.

The 2020 climate and energy package is a set of binding legislation that ensures that the EU will attain its climate and energy targets for 2020. The package sets three key targets:

- 20 per cent cut in greenhouse gas emissions (from 1990 levels);
- 20 per cent of EU energy from renewables; and
- 20 per cent improvement in energy efficiency.

The targets of the 2020 climate and energy package were set by EU leaders in 2007 and enacted in legislation in 2009. They are also headline targets of the Europe 2020 strategy for smart, sustainable and inclusive growth.

The 2020 climate and energy package determines national targets for each Member State to reduce greenhouse gas emission from emission sources which are not included in the emissions trading system – accounting for approximately 55 per cent of total EU emissions – this includes emissions from housing, agriculture, waste management, and transport. To determine the targets for Slovenia, transit transport was taken into account so as to raise greenhouse gas emissions from this sector by around 4 per cent compared to 1990.

In accordance with the Renewable Energy Directive, Member States adopted binding national targets to raise the share of renewable energy sources in energy consumption by 2020. A 25 per cent increase in the use of renewable energy sources by 2020 compared to the base year was determined for Slovenia.

The 2030 climate and energy framework include EU-wide targets for the period from 2021 to 2030. Key targets for 2030:

- at least 40 per cent cuts in greenhouse gas emissions (from 1990 levels);
- at least 32 per cent share for renewable energy; and
- at least 32.5 per cent improvement in energy efficiency.

The 2030 climate and energy framework was adopted by the European Council in October 2014. The targets of the 2030 climate and energy framework will enable the EU to move towards a low-carbon economy and implement its commitments under the Paris Agreement.

To achieve the target of the 2030 climate and energy framework:

- EU emissions trading system (ETS) sectors will have to cut emissions by 43 per cent (compared to 2005) – to this end, the ETS has been revised for the period after 2020;
- non-ETS sectors will need to cut emissions by 30 per cent (compared to 2005) – this has been translated into individual binding targets for Member States (see the figure below). By 2030, Slovenia must reduce greenhouse gas emissions from non-ETS sectors by 15 per cent compared to 2005.

⁴⁵ COM(2018) 773 final: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy.

According to the 2030 climate and energy framework, a binding renewable energy target for the EU for 2030 of at least 32 per cent of final energy consumption, including a review clause by 2023 for an upward revision of the EU level target. National targets have not yet been determined, which will stipulate renewable energy shares in final energy consumption for each Member State.

Member States are required to adopt integrated national energy and climate plans (NECPs) for the period 2021–2030. Member States had to submit their draft plans by the end of 2018. They had to submit their final plans by the end of 2019. This is a method of managing greenhouse gas emissions based on national plans for competitive, safe, and sustainable energy. Based on the Commission's guidelines, Member States will draft plans according to a joined-up approach that helps to ensure certainty for investors and greater transparency, and enhances compliance, coordination, and supervision of the European Union. The repetitive procedure between the Commission and Member States will provide sufficiently ambitious plans, their consistency and compliance.

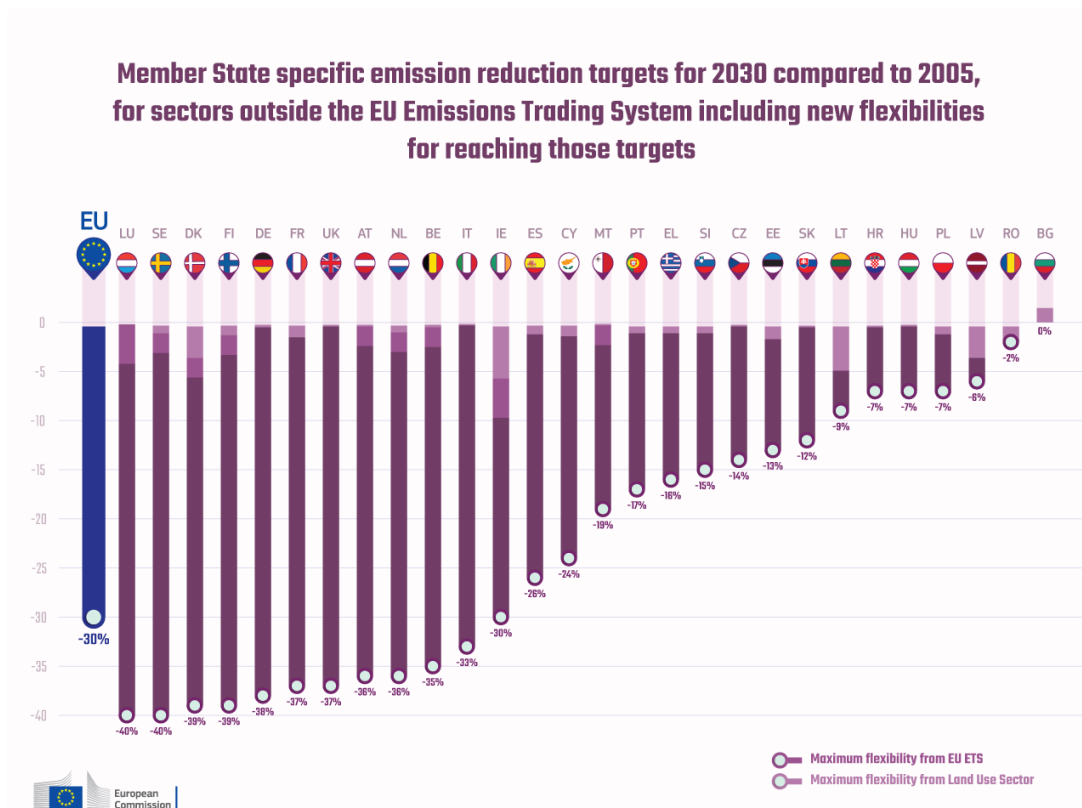


Figure 24: Reducing greenhouse gas emissions for Member States by 2030

*Attaining the 2020 climate and energy package*⁴⁶: in 2015, Slovenian GHG emissions increased by 1.3 per cent compared to 2014; however, Slovenia is still on track to attain the EU target. In 2015, emissions from non-ETS sectors were 13.4 per cent lower than the emission target for this year.

Guidelines for developing settlements have a positive impact on the reduction of greenhouse gas emissions (grade A).

⁴⁶ <http://kazalci.arso.gov.si/sl/content/izpusti-toplogrednih-plinov-7?tid=3>.

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The following guidelines included in the guidelines for urban development in particular have an impact on the reduction of greenhouse gas emissions:

- improving sustainable mobility for access to housing, various services, and jobs in urban settlements;
- re-parcelling and logically supplementing existing urban areas, primarily in areas with good accessibility by public passenger transport, primarily rail transport;
- supporting better public passenger transport by enhancing traffic routes in wider urban areas and connecting to neighbouring less densely populated areas with alternative means of public passenger transport (e.g. transport on call) to transfer points or hubs at the edge of functional urban areas;
- expanding the central intermodal terminal with rail and air passenger transport, and road public passenger transport;
- developing a freight intermodal terminal at the crossroads of the Mediterranean and Baltic-Adriatic corridors with rail and maritime transport at the port of Koper;
- priority handling of problems with the Ljubljana rail hub to provide suitable track capacity to increase the flow of passenger and freight transport.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and impact assessments of the guidelines for urban development on the reduction of greenhouse gas emissions. The section of guidelines for urban development that refers to greenhouse gas emissions contribute to lower greenhouse gas emissions.

Guidelines for urban development have a positive impact on the reduction of greenhouse gas emissions (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines included in the guidelines for rural developing in particular have an impact on the reduction of greenhouse gas emissions:

- reducing the needs for daily long-distance commute to work to centres of the highest level;
- improving accessibility of jobs and activities in centres at levels III and IV by public transport;
- priority development of agriculture, forestry and related activities;
- enhancing the use of renewable energy sources for local development;
- preparing alternative modes of public transport, and improving sustainable mobility to support further settlement of mountain and remote areas;
- integrating rural settlements in wider urban areas and other areas for functional integration into a public passenger transport and sustainable mobility system;
- reducing the share of means of transport running on fossil fuels, while boosting the efficiency of sustainable mobility;
- creating short local supply chains, reducing transport costs and environmental pollution by dedicating agricultural land to food production to supply towns outside wider urban areas and other areas for functional integration with a high production potential and nearby centres.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and impact assessments of the guidelines for rural development on the reduction of greenhouse gas emissions. The section of guidelines for rural development that refers to greenhouse gas emissions contribute to lower greenhouse gas emissions.

Guidelines for rural development have a positive impact on the reduction of greenhouse gas emissions (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

In accordance with the EU legislation⁴⁷ green infrastructure is “a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, green infrastructure is present in rural and urban settings.”

Approaches based on the establishment of green infrastructure are deemed to be the most widely applicable, economically viable and effective tools to combat the impacts of climate change because they use biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to or mitigate the adverse effects of climate change. Also important is the fact that green infrastructure initiatives in the agriculture and forestry sectors that have a positive effect on carbon stocks and the greenhouse gas balances in Member States will be taken into account in the framework of LULUCF⁴⁸, thus helping to put EU and UNFCCC⁴⁹ climate policies into practice.

Establishing green infrastructure is also a method of achieving lower carbon footprint from the transport and energy sectors, as it mitigates the negative effects of land uptake and fragmentation, and boosts opportunities to better integrate land use, ecosystem, and biodiversity concerns into the planning of the transport and energy sectors. Green infrastructure solutions may significantly contribute to the development of green transport corridors, e.g. by utilising healthy ecosystems for sustainable reduction of CO₂ emissions.

The Directive on the energy performance of buildings⁵⁰ supports the development and use of new materials and approaches to building construction, which will be part of efforts to reduce greenhouse gas emissions from this sector. Green infrastructure solutions, such as green roofs and walls, may help to reduce greenhouse gas emissions. This is because they require less energy for heating and cooling, and deliver many other benefits, such as water retention, air purification, and biodiversity enrichment.

Green infrastructure at national, regional and local levels provides primarily greater sinks and natural binding and storing (carbon sequestration) of greenhouse gas emissions.

Guidelines for green infrastructure at regional and local levels have a positive impact on the reduction of greenhouse gas emissions (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and coast

The following guidelines in particular have an impact on the reduction of greenhouse gas emissions:

- enhancing mutual functional integration of coastal towns in wider urban areas, particularly in terms of public transport;
- strengthening transboundary public passenger connections;

⁴⁷ COM(2013) 249 final: Communication from the Commission “Green Infrastructure – Enhancing Europe’s Natural Capital”.

⁴⁸ Land use, land use change and forestry.

⁴⁹ UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE.

⁵⁰ Directive 2010/31/EU on the energy performance of buildings (recast)

- upgrading and establishing the required energy infrastructure, including a gas transmission network for natural gas and renewable gases, and CO₂ neutral gases;
- focusing tourism on quality and environmental sustainability with a special emphasis on access to destinations.

Guidelines for developing the sea and coast do not have a significant impact on the reduction of greenhouse gas emissions.

1.5.2 Guidelines for tourist areas

As tourist areas develop, the number of visitors and, as a result, traffic and greenhouse gas emissions increase. Furthermore, tourism development requires a suitable infrastructure that contributes to additional greenhouse gas emissions. The SDSS guidelines for tourism development promote and establish sustainable mobility and strive for ensuring accessibility to tourist areas with sustainable mobility. The development of tourist infrastructure directs visitors to areas with an already established tourist infrastructure and does not introduce new areas for tourism.

Guidelines for tourist areas do not have a significant impact on the reduction of greenhouse gas emissions.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

Guidelines for preserving and improving the recognisability of settlements and the landscape do not have an impact on the reduction of greenhouse gas emissions.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

Guidelines for nature protection areas and cultural heritage areas do not have an impact on greenhouse gas emissions. A negative impact could be the result of the planned tourism development (increased traffic) and the provision of new tourist capacities around nature protection areas and cultural heritage areas, which is negligible if the SDSS guidelines for promoting and establishing sustainable mobility are taken into account.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

Guidelines for providing spatial capacities for a low-carbon society have direct and indirect positive impacts on the reduction of greenhouse gas emissions, as they promote:

- greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry, and the economy, tourism, agriculture, public administration, and households;
- the provision of spatial capacities for the use of renewable energy sources with the purpose of increasing their proportion in the primary energy balance in the country, including promoting the use of renewable gases in the gas network,
- the energy design of regions, towns and cities, and local communities that is based on local energy self-supply from renewable sources and the sufficient capacity of smart distribution networks,
- local business models for producing energy from renewable sources (e.g. energy community) that contribute to local supply,
- in areas with sufficiently large consumption, the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, and
- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural

heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The comprehensive impact assessment of guidelines for special areas and regions on the reduction of greenhouse gas emissions: the section of guidelines for special areas and regions which refers to greenhouse gas emissions contributes to lower greenhouse gas emissions. Guidelines for special areas and regions have a positive impact on the reduction of greenhouse gas emissions (grade A).

Set 2 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

Guidelines include guidelines for developing transport infrastructure and services on it, which supports the development of the polycentric urban system and inclusion of the state in international traffic flows. Guidelines included in this group, which have a direct impact on the reduction of greenhouse gas emissions, address:

- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling, use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes that connect urban centres and tourist settlements, and are connected to the long-distance European cycling connections that run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics), which are connected to centres at levels I and II or to wider urban areas and other areas for functional integration;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

The impact of guidelines for developing transport infrastructure on the reduction of annual greenhouse gas emissions: transport constitutes almost a quarter of greenhouse gas emissions in Europe and is the main source of air pollution in towns and cities. The transport sector has not seen the same gradual reduction in emissions as other sectors: emissions began declining in 2007 and remain higher than in 1990 (see diagram below). In this sector, road transport is by far the largest polluter and produces over 70 per cent of all greenhouse gas emissions from transport.

In accordance with the shift towards circular economy with low carbon emissions, A European Strategy for Low-Emission Mobility⁵¹ was adopted in 2016, with the objective of ensuring that Europe is competitive and able to cater to the increasing mobility needs of people and goods.

⁵¹ COM(2016) 501 final; A European Strategy for Low-Emission Mobility.

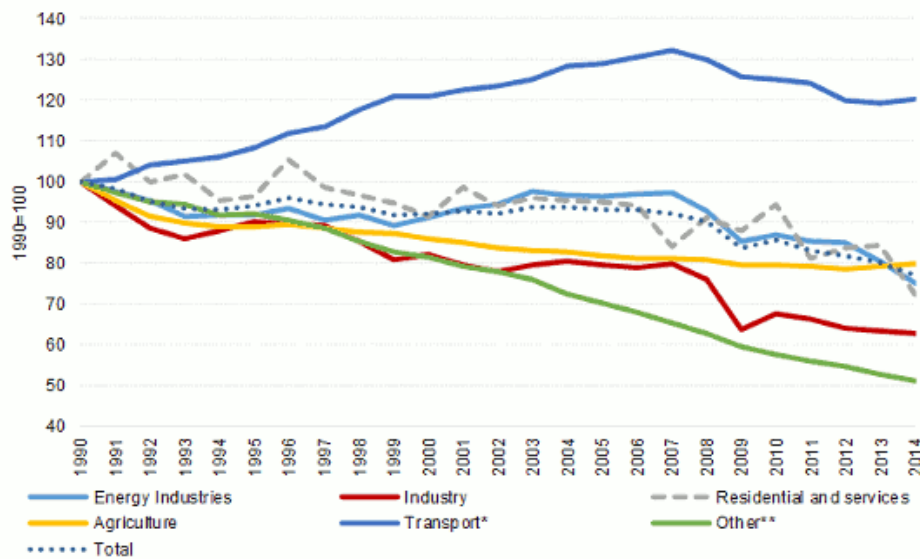


Figure 25: Annual greenhouse gas emissions from individual EU sectors.

The European Strategy for Low-Emission Mobility defines three priority areas for action:

- higher efficiency of the transport system by utilising digital technologies, smart pricing, and further promotion of a shift to low-emission mobility;
- the promotion of low-emission alternative energy for transport, such as biofuels, electricity, hydrogen, and renewable synthetic fuels, and the elimination of barriers for transport electrification;
- moving towards zero emission vehicles: while further improvements in the combustion engine are needed, Europe must step up the transition to low- and zero emission vehicles.

Cities and local communities are crucial to the implementation of this strategy by promoting the use of alternative energy and low-emission vehicles, active mobility (cycling and walking), public transport, and bike- and car-sharing and car-pooling to reduce congestion and air pollution in cities.

The section of the guidelines for developing transport infrastructure that refers to greenhouse gas emissions contributes to lower annual greenhouse gas emissions. Guidelines for developing transport infrastructure have a positive impact on the reduction of greenhouse gas emissions (grade A).

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The following guidelines included in the guidelines for developing energy infrastructure to support the transition to a low-carbon society in particular have an impact on the reduction of greenhouse gas emissions:

- promoting greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry, and the economy, tourism, agriculture, public administration, and households;
- replacing fossil fuels by using the technologically and economically exploitable potentials of renewable sources,
- promoting the use of renewable gases in the gas network;
- supporting local business models for producing energy from renewable sources that contribute to local supply, particularly in mountain areas and remote areas,
- promoting the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, in areas with a sufficiently large consumption.

The section of guidelines for developing energy infrastructure to support the transition to a low-carbon society that refers to greenhouse gas emissions contributes to lower greenhouse gas emissions. Guidelines for developing energy infrastructure in support of a transition into a low-carbon society have a positive impact on the reduction of greenhouse gas emissions (grade A).

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

Guidelines for energy networks have an indirect (the restoration and upgrading of the electricity grid) and direct (the restoration and upgrading of the gas network) impact on greenhouse gas emissions. The impact of the guidelines for energy networks on the reduction of greenhouse gas emissions is insignificant (grade B).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

Guidelines for protecting and supplying raw mineral materials do not have an impact on the reduction of greenhouse gas emissions (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for rural development, agriculture, forestry and fisheries do not have an impact on the reduction of greenhouse gas emissions (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain the nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development,

particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on the reduction of greenhouse gas emissions (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account the guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the reduction of greenhouse gas emissions (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities do not have a direct impact on the reduction of greenhouse gas emissions (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters do not have a direct impact on the reduction of greenhouse gas emissions (grade A).*

Indicator for status monitoring regarding the reduction of greenhouse gas emissions:

-[PS03] Greenhouse gas emissions: The indicator shows the movement of greenhouse gas emissions in Slovenia, the main sources of emissions (according to category and industry sectors) and a comparison with the European Union member states (EU-28). Emissions for trading (EU ETS) as well as emissions that are not part of trading are shown. Emissions are shown using the unit Gg CO₂-eq.

Environmental objective 9: Reduce the vulnerability of infrastructure and settlements to climate change

Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The following guidelines included in the guidelines for planning and developing settlements in particular have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change:

- during an overhaul of settlements, special attention is paid to the functional aspects of the overhaul, the anti-seismic reconstruction of buildings, better material efficiency, and the

- quality of open space and green areas. This contributes to a better quality of life, lower carbon footprint at the level of buildings, neighbourhoods, and settlements, enhanced resilience to climate change, and a reduced need for the expansion of settlements;
- the vulnerability of settlements and infrastructure due to climate change or natural disasters is intentionally reduced, particularly by moving settlements and infrastructure from endangered areas, and establishing natural safeguards against extreme events and heat islands (e.g. by preserving and establishing overflow areas, more well-maintained green areas as elements of green infrastructure, and green systems of regions and towns);
 - areas earmarked for long-term development may not increase the vulnerability of space in the general area of a settlement, i.e. they may not increase flood risk or intervene with natural overflow areas or other areas with potential natural disasters that arise from current or potential risk, taking into account the expected consequences of climate change.

The impact of guidelines for planning and developing settlements on the reduction the vulnerability of infrastructure and settlements to climate change: In 2013, the Commission adopted the EU Strategy on adaptation to climate change⁵². The aim of the Strategy is to contribute to a more climate-resilient Europe. By employing a coherent approach and providing better coordination, the strategy strives to enhance the preparedness and capacity to respond to the impacts of climate change at all levels.

The EU Strategy on adaptation to climate change is focused on three key targets:

- promoting action by Member States: The Commission encourages all Member States to adopt comprehensive adaptation strategies and provide funds to help them build new adaptation facilities and take action;
- action to prevent climate change at the EU level by further promoting adaptation in key vulnerable sectors, such as agriculture, fisheries, and cohesion policy, providing greater resilience of European infrastructure, and promoting insurance against natural and man-made disasters;
- better informed decision-making by filling in knowledge gaps on adaptation and further developing the European Climate Adaptation Platform.

In 2018, the Commission published an assessment of the implementation of the EU Strategy on adaptation to climate change. The result was a report on lessons learned and considerations of improvements for future action⁵³. The assessment indicates that the Strategy has attained its objectives with progress being recorded in all addressed measures; however, Europe is still vulnerable to climate impacts within and outside of its borders. It has become clearer since 2013 that international climate action as determined in the Paris Agreement from 2015 must acknowledge and deal with current and foreseen impacts of global warming of 1.5°C or 2°C.

Key findings of the assessment of the implementation of the EU Strategy on adaptation to climate change, which refer to the guidelines for attaining the SDDS 2050 objectives, are as follows:

- major infrastructural projects financed from the EU budget must be resilient to climate by preventing the sea level, floods, or extreme heat from rising;
- efforts must be made in the future for most or all EU cities to rely on thorough adaptation plans to protect their citizens from extreme and slow-onset climate hazards. Plans must take into account the special vulnerabilities of certain communities and various risks different European regions face;
- adaptation must support and protect biodiversity (natural solutions).

Climate change adaptation must be a strong ally to sustainable development and efforts to reduce disaster risks. In 2016, the Strategic Framework and Guidelines for Climate Change Adaptation in

⁵² COM(2013) 216 final: An EU Strategy on adaptation to climate change.

⁵³ COM(2018) 738 final: Report from the Commission on the implementation of the EU Strategy on adaptation to climate change.

Slovenia was adopted⁵⁴. The Strategic Framework for Slovenia points out that changes in climate variables are above average. The most evident change is higher air temperature, changes in precipitation regime are significant, and extreme weather events are on the rise.

The Strategic Framework for Slovenia establishes that Slovenia has many diverse regions and climate types, making predicting the expression of individual impacts of climate change even more difficult. More efficient implementation of the applicable legislation, and the development of knowledge and new approaches to adapt to climate change pose a particular challenge. First and foremost, the Strategic Framework for Slovenia requires guidelines for better mainstreaming of adaptation in all policies, measures, and actions. The Strategic Framework for Slovenia addresses the following horizontal guidelines:

- climate change impacts are comprehensively mainstreamed in the creation and implementation of all policies, measures, and activities at the level of states, regions, local communities, business entities, and individuals. It is particularly important to take into account climate change impacts **in development and spatial planning**;
- wider cooperation, connection, and exchange of experiences and best practices must be ensured;
- knowledge of climate change impacts and ways to adapt to them must be constantly improved;
- a suitable level and quality of education, training, awareness, information, and wider communication on climate change impacts must be reached.

The section of guidelines for developing settlements that refers to the vulnerability of infrastructure and settlements to climate change contributes to the reduction of the vulnerability of infrastructure and settlements to climate change.

Guidelines for developing settlements have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Guidelines for urban development do not directly address the vulnerability of infrastructure and settlements to climate change.

Guidelines for urban development do not have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The following guidelines included in the guidelines for rural development in particular have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change:

- agriculture significantly affects the image of the cultural landscape, its biodiversity, and artistic value, making it multifunctional. It maintains the landscape, and bears new landscape patterns and new space identity, which are the result of new technologies for food production and new crops, arrangements to adapt to climate change, and the use of renewable energy sources. Agricultural space is planned comprehensively, while taking into account potentials for various types of agricultural production, and guidelines for preserving ecological connectivity, protecting habitats and waters, and recognisable landscape;

⁵⁴ Strategic Framework and Guidelines for Climate Change Adaptation in Slovenia.

- options for sharing water resources with energy utilisation, while taking into account limitations due to various other protection aspects, are sought in agriculture to adapt to climate change;
- forests are the most extensive natural system providing a habitat to wild animals and plants, are economically utilisable and renewable natural resource, have a positive impact on the quality of the environment and life, and mitigate, and are themselves susceptible to, climate change impacts.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and impact assessments of the guidelines for rural development on the reduction of the vulnerability of infrastructure and settlements to climate change. The section of guidelines for rural development that refers to the vulnerability of infrastructure and settlements to climate change contributes to the reduction of the vulnerability of infrastructure and settlements to climate change.

Guidelines for rural development have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The following guidelines included in the guidelines for green infrastructure at regional and local levels in particular have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change:

- the green system of a region provides for the multi-functionality of space at the regional level, particularly for the ecological and environmental function, and compatible use of space, the preservation or improvement of a favourable status of habitats in Natura 2000 areas, the adaptation to climate change, particularly by preserving overflow areas/floodplains, the natural restoration of natural ecosystems, particularly the soil and forests, the recognisability of the landscape, and outdoor recreation;
- green systems of settlements, which constitute green infrastructure at the local level, are related to green systems of regions. Green systems of settlements include landscape elements and individual parts of the open space in the area of individual settlements, which are inseparably connected to their structure and function, appearance and identity, the quality of the living environment, and the adaptation to climate change, and respond, as a whole, to various needs of residents regarding the use and experience of green and other open spaces in towns and settlements. They may also include separate green belts between settlements and green roofs.

In accordance with the EU legislation⁵⁵ green infrastructure is “*a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, green infrastructure is present in rural and urban settings.*”

Green infrastructure solutions are a significant part of the EU disaster risk-management policy. Climate change and infrastructure development make disaster-prone areas more vulnerable to extreme weather events and natural disasters, such as floods, landslides, avalanches, forest fires, storms and wave surges. The impact of such events on society and the environment may frequently be reduced with green infrastructure solutions, such as dedicated floodplains, riparian woodland, protection

⁵⁵ COM(2013) 249 final: Communication from the Commission “Green Infrastructure – Enhancing Europe’s Natural Capital”.

forests and mountainous areas, barrier beaches and coastal wetlands that can be made in combination with infrastructure for disaster reduction, such as river protection works. Green infrastructure can also help to reduce vulnerability to risks by supporting local livelihoods and economies in the area in question. Towns, cities, and local communities are the first ones to combat the direct results of such disasters and play a key role in implementing preventive measures, such as green infrastructure.

Guidelines for green infrastructure at regional and local levels have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and coast

The following guidelines included in the guidelines for developing the sea and coast in particular have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change:

- the development strategies of the coast or tourism in the coastal area, which are a part of regional or local development and spatial planning documents, must, as a priority, include activities related to adapting to climate change, particularly in the development and planning of settlements and green infrastructure, port activities, and activities for managing natural resources. Solutions must address the adaptation of settlement areas to sea level rise, more droughts, lack of drinking water and water for business, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services;
- in accordance with the Protocol on Integrated Coastal Zones Management, a coastal area is to be established along the length of the coast, where construction is not permitted, although the Protocol allows certain exceptions. The coastal area along the length of the coast is intended to conserve nature/preserve natural habitats and landscape, natural resources and ecosystems, for ecological connections between inland areas and the sea, and the adaptation to climate change. The coastal area is part of green systems of coastal towns, other settlements and regions, which improves the quality of life in the coastal area. It also provides a connection with the green infrastructure system of the state. The coastal area where construction is not permitted and the contents of legal regimes in it are defined in more detail in the maritime spatial plan, implemented through municipal spatial plans, and monitored as a spatial regime in the spatial information system.

Guidelines for developing the sea and coast have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change.

1.5.2 Guidelines for tourist areas

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

1.5.4 Guidelines for nature protection areas and cultural heritage areas

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

Guidelines under points 1.5.2, 1.5.3, 1.5.4 and 1.5.5 do not have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change.

The comprehensive impact assessment of guidelines for special areas and regions on the reduction of the vulnerability of infrastructure and settlements to climate change: the section of guidelines for special areas and regions which refers to the vulnerability of infrastructure and settlements to climate change contributes to the reduction of the vulnerability of infrastructure and settlements to climate change or do not have an impact on such reduction. The impact of guidelines for special areas and regions on the reduction the vulnerability of infrastructure and settlements to climate change is assessed with grade A.

Set 2 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

Guidelines for developing transport infrastructure do not specifically address guidelines for reducing the vulnerability of infrastructure and settlements to climate change.

In 2013, the Commission issued the EU Strategy on adaptation to climate change (COM(2013) 216 final). The general objective of the EU Adaptation Strategy is to contribute to a more climate-resilient Europe. This means enhancing the preparedness and capacity to respond to the impacts of climate change at the local, regional, national and EU levels, developing a coherent approach and improving coordination.

The EU Strategy on adaptation to climate change states that the climate change adaptation has already been mainstreamed in EU transport legislation, i.e. in the provisions of Regulation (EU) No 1315/2013 on Union guidelines on the development of the trans-European transport network.

The provisions of Article 5 of Regulation (EU) No 1315/2013 requires Member States to plan, develop and operate the trans-European transport network in a resource-efficient way, which means that the sensitivity of transport infrastructure to climate change is properly observed.

Article 41 of Regulation (EU) No 1315/2013 defines in more detail what is deemed to be appropriate handling of the sensitivity of transport infrastructure to climate change. The provisions of this Article require Member States to take into account, when planning infrastructure, measures from risk assessment and adaptations which suitably enhance resilience to climate change, especially in relation to precipitation, storms, high temperatures, and heat waves, drought, rises in sea level and storm surges. Pursuant to Article 41 of this Regulation, an analysis of the sensitivity of transport infrastructure to climate change must be prepared for all measures in the Strategy, and based on its results, measures and adaptations which suitably enhance the resilience to climate change must be carried out.

Since measures in the field of climate change adaptation are treated as general measures at the strategic level of transport policy development, measures from the general measure group must be expanded by creating guidelines, methodology and procedures for collecting information about extreme weather events, and for planning and implementing:

- measures to improve the resilience of the road network to floods;
- measures to improve the resilience of the road network to snow; and
- measures to improve the resilience of the rail network to glaze ice.

Impacts of guidelines for developing transport infrastructure on the reduction of the vulnerability of infrastructure and settlements to climate change are assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for developing transport infrastructure for attaining the objective to reduce the vulnerability of infrastructure and settlements to climate change:

With regard to transport infrastructure, energy infrastructure, and energy networks, guidelines, a methodology, and procedures need to be drafted for how to act when collecting information regarding extreme weather conditions and when planning and implementing:

- measures to improve the resilience of the road network and energy infrastructure to floods;
- measures to improve the resilience of road and energy networks to snow; and
- measures to improve the resilience of rail and energy network to glaze ice.

The provided general mitigation measures for attaining the objective (9) 'Reduce the vulnerability of infrastructure and settlements to climate change' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed in particular when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[PS01] Estimated damage caused by natural disasters: The indicator shows the estimation of damage caused by natural disasters that are made by the competent national commission or municipal commissions through direct inspection of means and goods in private and other ownership that were affected by any form of natural-disaster-related damage. Natural disasters are a result of a natural phenomenon (earthquake, flood, fire, drought, storm, hail, frost, glaze ice, instability or sliding of land and snow), an epidemic (mass communicable diseases in humans), epizootic diseases (mass diseases in animals), damage due to various plant pests and diseases, environmental disasters, and other accidents – the results of human activities and actions, when various events related to performing an activity or managing work assets and when handling hazardous materials get out of hand and threaten the life or health of humans, animals, property, cultural heritage, and the environment.

The analysis of the data collected covers the causes of natural disasters and the percentage of estimated damage according to individual disaster types in relation to Slovenia's annual GDP.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

Guidelines for developing energy infrastructure to support the transition to a low-carbon society to do not specifically address the guidelines for reducing the vulnerability of energy infrastructure to support the transition to a low-carbon society to climate change.

Impacts of guidelines for developing energy infrastructure to support the transition to a low-carbon society on the reduce the vulnerability of infrastructure and settlements to climate change are assessed as insignificant under the conditions (grade C).

To reduce negative impacts, measures prescribed in GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE in Set 2 (Guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for development/drafting public policies) should be taken into account.

2.3 GUIDELINES FOR ENERGY NETWORKS

Guidelines for energy networks do not specifically address the guidelines for reducing the vulnerability energy networks to climate change.

Impacts of the guidelines for energy networks on the reduction of the vulnerability of infrastructure and settlements to climate change are assessed as insignificant under the conditions (grade C).

To reduce negative impacts, measures prescribed in GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE in Set 2 (Guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for development/drafting public policies) should be taken into account.

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING RAW MINERAL MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous raw mineral materials to the state. The utilisation of indigenous raw mineral materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant raw mineral materials primarily refers to the utilisation of raw mineral materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of raw mineral materials in construction is expected to be reduced.

Guidelines for protecting and supplying raw mineral materials do not have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for rural development, agriculture, forestry and fisheries do not have an impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation do not have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macro regions, taking into account the guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters have a positive impact on the reduction of the vulnerability of infrastructure and settlements to climate change (grade A).*

7.2.6 HUMAN HEALTH

Environmental objective 10: Provide people with a safe supply of wholesome drinking water in sufficient quantities

Set 1 of the guidelines for attaining the objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The guidelines for planning and developing settlements address the reduction and prevention of adverse effects on human health from the aspect of *safely supplying people with wholesome drinking water in sufficient quantities* with the following general guidelines for planning and developing settlements:

- the quality of life in settlements is raised by: improving the *access to services of general interest and general economic significance*, access to housing and jobs through sustainable mobility methods and by reducing mobility needs (improving the possibility of working from home); by reducing living costs in towns and cities, particularly through *energy efficient construction and cascading use of energy* at the level of buildings or settlements; by improving the possibilities for at least 5-minute accessibility on foot to green areas and outdoor recreation; by *reducing noise levels in settlements*, e.g. by encouraging the use of less noisy means of transport; by reducing or adjusting *night lighting*, particularly along roads and in the immediate vicinity of dwellings, hospitals, social institutions, especially in areas with landscape recognisability, in broader protected areas and cultural heritage areas; by *improving*

the air quality in settlements, reducing emissions from combustion plants and means of transport, and by improving the structure, type, and size of green areas and their maintenance as factors that buffer emissions and improve air quality.

- to improve the recognisability of settlements and the landscape and enable ecological connectivity, separative green belts are introduced between settlements as part of a settlement's green system that connects to the green system of the region. Green belts may include forests, *water and waterside areas*, extensively used agricultural land, and nature protection areas. The width of green belts is determined depending on the role of a green belt for ecological connectivity (wildlife migration paths), recreational role, *climate role (average wind speed)*, and the image of the landscape, although they should not be narrower than 200 metres (1,000 metres for wildlife migration paths). If they are narrower, they are maintained in the current size. Permanent interventions that would reduce or eliminate their purpose are not to be carried out in separative belts;
- economic and business zones in settlements are sited near transport hubs by providing good connections particularly with public transport from all areas of a region and neighbouring regions. When selecting the location, options for the reconstruction and rehabilitation of abandoned industrial, municipal, transport, and similar degraded areas. Areas for economic development must, as a whole and as individual parts, show *environmental sustainability, i.e. material, energy, and spatial efficiency*, and they must operate according to the principle of industrial symbioses and have a large proportion of green areas as an element contributing to good working conditions, adaptation to climate change, and mitigating visible or *environmental impacts (such as noise)*.

Impacts on the provision of a safe supply of wholesome drinking water to people in sufficient quantities: safe supply of people with wholesome drinking water in sufficient quantities is regulated by Directive 98/83/EC on drinking water. The objective of this directive is to protect human health from the adverse effects of any contamination of water intended for human consumption.

Directive 98/83/EC on drinking water applies to all supply systems that supply more than 50 people or provide more than 10 m³ of drinking water a day, and supply systems that serve fewer than 50 people or provide less than 10 m³ of drinking water a day if water is supplied as part of a commercial activity. The provisions of this directive also apply to drinking water in bottles or containers.

Directive 98/83/EC on drinking water stipulates the drinking water quality standards at the EU level. 48 microbiological, chemical, and indicative parameters must be regularly monitored and tested. In general, the WHO guidelines for drinking water and the opinion of the Commission's Scientific Advisory Committee are used as the scientific basis to determine the drinking water quality standards. Member States must not determine lower standards for these parameters, as it must ensure that the level of human health protection is the same throughout the European Union.

Directive 98/83/EC on drinking water also requires that consumers are regularly informed. In addition, the quality of drinking water must be reported to the European Commission every three years. The Commission assesses the results of the water quality monitoring according to the standards under Drinking Water Directive, and prepares a synthesis report after each reporting cycle, which summarises the drinking water quality and its improvement at the European level.

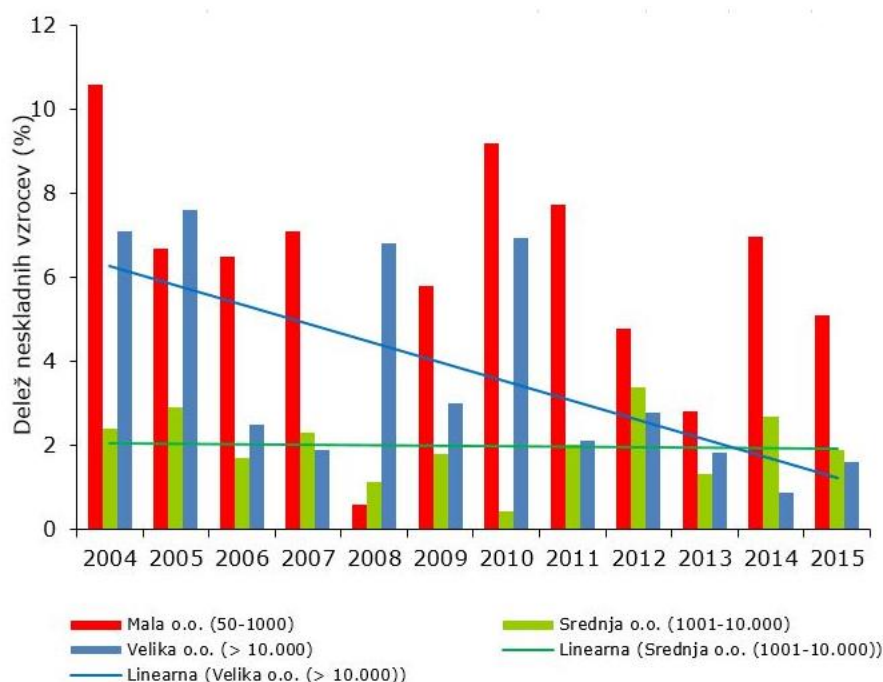
Wholesomeness of drinking water in Slovenia: the last available Commission's consolidated report⁵⁶ shows that drinking water was wholesome in Slovenia between 2005 and 2007. The Commission's synthesis report also shows that 75 major supply zones provide drinking water in Slovenia to 1.4 million residents, while the remaining 0.6 million residents are supplied from smaller water supply

⁵⁶ Synthesis report on the quality of drinking water in the Member States of the European Union in the period 2005-2007 Directive 98/83/EC, December 2012.

zones (systems for fewer than 50 residents). Major supply zones supply 327 million m³ of water a year. Groundwater (97 per cent) is mainly used as the drinking water source for major supply zones.

According to the Slovenian Environment Agency, in 2017, 94 per cent of people in Slovenia were supplied with drinking water from the water supply zones where quality monitoring was implemented at the site of use, i.e. at the user's tap⁵⁷. Six per cent of Slovenian residents were not included in the drinking water monitoring in 2017; this involves zones that supply fewer than 50 people (e.g. their own drinking water supply, self-sufficiency) or people were not included in the monitoring for other reasons (e.g. incomplete capture). In Slovenian towns, all residents are supplied with drinking water that is monitored.

The Commission's synthesis report for Slovenian concludes that the frequency of the drinking water monitoring in Slovenia between 2005 and 2007 was in full compliance with the requirements of the Drinking Water Directive. Microbiological parameters E.coli and Enterococci caused non-compliance in over 1 per cent of the samples taken in the stated period. E. coli caused non-compliance in many water supply zones, while Enterococci caused non-compliance in just one or two water supply zones. Chemical parameters of individual pesticides (atrazine, bentazone, desethylatrazine, terbutylatrazine, metalochlor) caused non-compliance in some supply zones. Slovenia reported that, in all three reporting years, non-compliance for Coliform bacteria was higher than 5 per cent although lower than ten per cent.



Share of non-compliant samples (%)		
	Small s.z. (50-1,000)	Medium s.z. (1,001-10,000)
	Large s.z. (>10,000)	Linear s.z. (Medium s.z. (1,001-10,000))
	Linear s.z. (Large s.z. (>10,000))	

Figure 26: Share of non-compliant samples for chemical parameters – indicator VD08-3.

⁵⁷ <http://kazalci.arso.gov.si/sl/content/dostop-do-pitne-vode-0?tid=7>.

According to the Slovenian Environment Agency, the non-compliance of the samples taken between 2004 and 2015 reduced both in terms of faecal pollution (presence of *E. coli*), particularly in small supply zones, and chemical parameters, which is shown in the figure above⁵⁸.

The Commission's synthesis report claims that Slovenia did not report on the reasons for the non-compliance of the wholesomeness of drinking water with the standards under Directive 98/83/EC on drinking water, or on action plans to eliminate the non-compliance. In view of the parameters for which non-compliance with the standards under Directive 98/83/EC on drinking water was established, it is evident that the non-compliance is caused by:

- insufficiently maintained sewerage systems in the influence areas of drinking water sources; and
- intensive use of pesticides in agriculture in the areas of drinking water sources for certain supply zones.

Sufficient quantity of wholesome drinking water: Water scarcity and droughts affect the provision of wholesome drinking water in sufficient quantities. The probability of occasional water scarcity is not only limited to Southern Europe, as it also extends to river basins in Central Europe and to Northern Europe. Climate change and population growth are expected to aggravate existing water problems in many regions. With presumed changes in temperature and precipitation, water availability in Southern and South-East Europe is expected to be lower (by ten or more per cent in certain river basins by 2030)⁵⁹. The latest studies⁶⁰ indicate that the forecast of changes in precipitation in Slovenia as a result of climate change is uncertain, although periods of summer heat and drought are to be expected, occasionally reducing water availability.

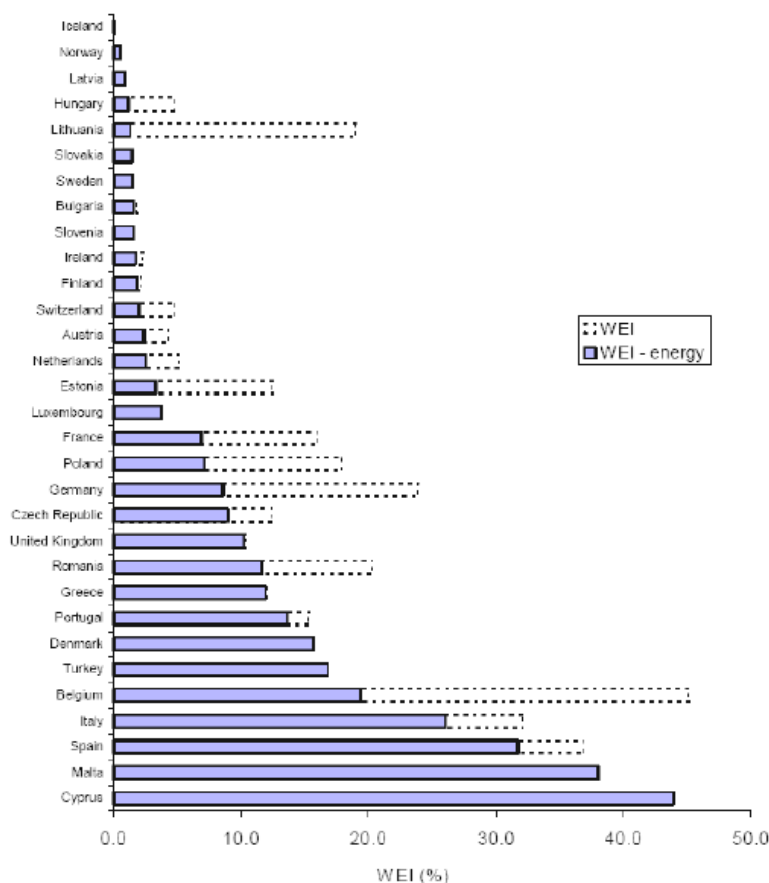
The most important water uses are energy production (water energy and cooling of power plants), agriculture, water use related to the public water supply system, and industry. Total water abstraction in Europe is 353 km³/year, which means that approximately ten per cent of all surface water available in Europe is abstracted annually. An average of 44 per cent of abstracted water is used as cooling water in the energy sector, around 24 per cent is used for irrigation in households, 21 per cent for drinking water supply, and 11 per cent in industrial processes⁶¹.

⁵⁸ <http://kazalci.arso.gov.si/sl/content/kakovost-pitne-vode-4?tid=16>.

⁵⁹ European Commission, Study on Water Efficiency Standards, final report, July 2009, Reference: 070307/2008/5208889/ETU/D2.

⁶⁰ IPCC – Intergovernmental Panel on Climate Change, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change 2013; Physical Science Basis, Summary for Policymakers.

⁶¹ Water abstractions per sector for the period 1997–2005 (Eurostat, 2005).



* Solid bar: WEI without water abstraction for energy cooling;
 Dotted bar: WEI based on total water abstraction.

Figure 27: Values of the “water exploitation index” indicator

The figure above shows the “water exploitation index” indicator (WEI)⁶² for various European countries. The alert threshold is when the value of the WEI indicator rises to 20 per cent, Large pressure due to lower water availability occurs when the value of the WEI indicator is 40 per cent. In accordance with the displayed values of the WEI indicator, and the data of the Slovenian Environment Agency⁶³, Slovenia is on the safe side. The risk of water availability for sufficient quantity of wholesome drinking water to significantly decrease is not high despite anticipated climate change impacts.

Regardless of this relatively favourable prognosis given for Slovenia by the WEI indicator, it should be noted that the drinking water in Slovenia mainly comes from groundwater, which means that groundwater recharge in shallow aquifers is more important for the reliable drinking water supply. The total rechargeable groundwater quantity in shallow aquifers of Slovenia is shown with the [VD15] “Groundwater recharge” indicator for individual hydrological years.

⁶² WEI stands for “water exploitation index”.

⁶³ In 2014, the annual WEI indicator for Slovenia was around two per cent. <http://kazalci.arso.gov.si/sl/content/indeks-izkoriscanja-vode-0>.

In 2015, water use for drinking water supply in EU Member States was between 159.1 m³ of water per inhabitant in Italy (data for 2012) to the lowest value of 31.3 m³ of water per inhabitant in Malta – see the figure below on water use for the drinking water supply.

People's behavioural patterns regarding water consumption from the public supply reflect special conditions in EU Member States: for example, in Ireland (135.5 m³ per inhabitant) water consumption from public supply was still free of charge for numerous households, in Bulgaria (120.7 m³ per inhabitant), there were major losses due to the public network. Abstraction rates were also high in certain countries that are not EU Member States, particularly in Norway (169 m³ per inhabitant; data for 2014). Water consumption for water supply to people in Slovenia was near the EU average and amounts to 80 m³ per inhabitant.

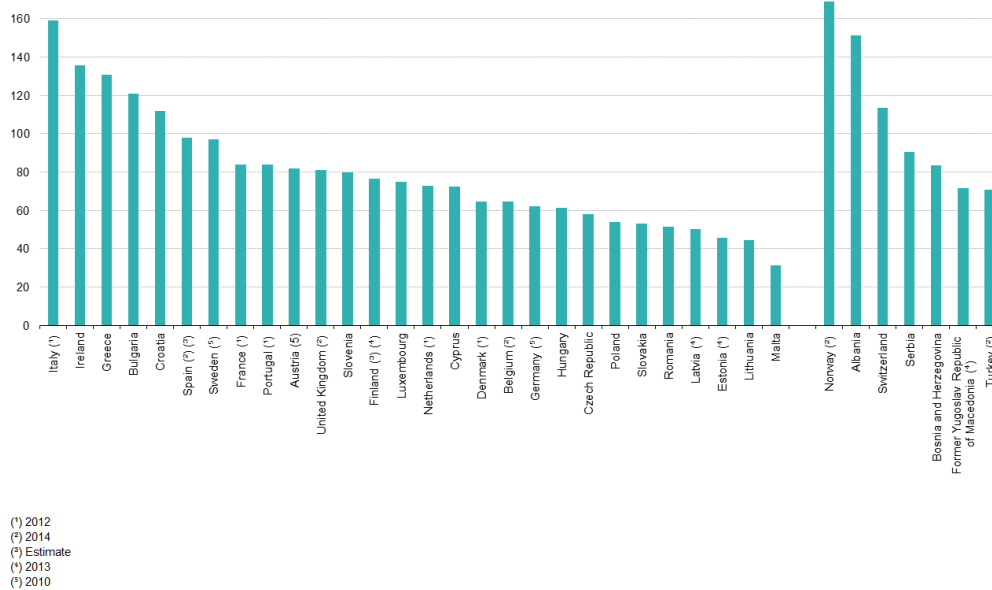


Figure 28: Water use for the drinking water supply.

In view of the potential climate change impacts, water in the European Union is increasingly acknowledged as a challenge. Reduced demand and increased efficiency of water use are crucial to reduce pressure on water bodies and related ecosystems.

Water management is a local and seasonal issue, and is related to issues of water quality. Since public water supply amounts to 21 per cent of all water consumption in the European Union (in Slovenia, the share of water for drinking water supply in view of total water use is slightly lower – 17.3 per cent⁶⁴), initiatives to reduce water consumptions in buildings, promote water saving, and prevent losses from the water supply network must be implemented at the local or national level. To reduce water consumption at the EU level, recommendations were prepared to implement measures to promote efficient use of drinking water, and impact assessments of the implementation of the approach to efficient water use in buildings were made⁶⁵.

⁶⁴ https://ec.europa.eu/eurostat/statistics-explained/index.php/Water_statistics#Water_as_a_resource.

⁶⁵ Water Performance of Buildings, Final report, European Commission, DG Environment, August 2012.

Settlement development and the provision of suitable infrastructure (water supply system, sewerage system, etc.) may have significant impacts on the provision of wholesome drinking water in sufficient quantities:

- the siting of infrastructure (water supply system, sewerage system, etc.) may have a permanent direct or indirect impact on the hydrological status of aquifers;
- the siting of settlement and infrastructure in areas with extremely highly, very highly and highly vulnerable aquifers may have negative impacts on existing and potential water resources (direct, remote, transboundary);
- siting in safeguard zones of protected water resources (local, potentially regional and transboundary impact).

The impact of guidelines for planning and developing settlements on the provision of a safe supply of wholesome drinking water to people in sufficient quantities is assessed as insignificant under the conditions (grade C).

General mitigation measures for planning and developing settlements for attaining the objective to provide people with a safe supply of wholesome drinking water in sufficient quantities:

Development of settlements and siting of infrastructure is to be implemented in such a way as to:

- not have a permanent direct or indirect impact on the hydrological status of aquifers,
- not site settlements and infrastructure in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- avoid the siting of settlements and infrastructure in safeguard zones of drinking water sources.

The provided general mitigation measures for attaining the objective (10) 'Provide people with a safe supply of wholesome drinking water in sufficient quantities' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed in particular when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[ZD05] Access to drinking water: This indicator shows the number and percentage of inhabitants of the Republic of Slovenia who are supplied with drinking water from drinking water supply systems that were included in drinking water monitoring.

-[VD08] Drinking water quality: This indicator shows the percentage of non-compliant drinking water samples due to microbiological and chemical pollution, by size classes of drinking water supply areas. With regard to microbiological pollution, the indicator shows faecal pollution (presence of the *E. coli* bacteria); with regard to chemical pollution, it shows chemical parameters that are relevant for human health (stated in Appendix I, Part B of the Rules on Drinking Water: Chemical Parameters). In addition to the non-compliance of samples, the indicator also shows the number of people exposed to exceeded concentrations of pesticides and nitrates.

- Indicator of unsuitable protection of a drinking water source: number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Water Act.

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Urban development of towns and other urban settlements is crucial for the improvement of the economic, social and environmental efficiency of the state. Urban settlements are the most important elements in urban development, whose population density increases with renovations or expansions in accordance with guidelines for urban development. Guidelines for urban development address the reduction and prevention of adverse effects on human health from the aspect of *safely supplying people with wholesome drinking water in sufficient quantities* with the following guidelines for urban development:

- urban development ensures the distribution of activities, social infrastructure, dwellings, and economic infrastructure to urban settlements, the provision of utility infrastructure for residential and production purposes, *supply and services* in suitable locations, and areas for recreation and spending leisure time outdoors;
- the development opportunities and challenges that towns and cities are faced with go beyond their physical boundaries, so urban development supports the coordinated and interconnected development of towns and cities, other urban settlements, and broader urban areas;
- urban settlements are the most important elements in urban development. They constitute a vital, harmonious, and well-maintained environment, which provides conditions for economic and social development, and contributes to *the quality of life for all residents*. They are developed according to the principle of multi-functionality, and the principle of complementarity is used to promote the mixed use of space. In order to develop an efficient town or city, a suitable ratio between the use of land and buildings is provided, and efforts are made to ensure a mix of various functions and activities.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for urban development on the reduction and prevention of adverse effects on human health from the aspect of *safely supplying people with wholesome drinking water in sufficient quantities*.

The impact of the guidelines for planning and developing settlements on the provision of a safe supply of wholesome drinking water to people in sufficient quantities is assessed as insignificant under the conditions (grade C).

General mitigation measures of the guidelines for urban development for attaining the objective to provide people with a safe supply of wholesome drinking water in sufficient quantities:

Urban development of towns and other urban settlements should:

- not have a permanent direct or indirect impact on the hydrological status of aquifers,
- not site dwellings and public service infrastructure in areas with incredibly high, very high, or high-level aquifer vulnerability; and
- avoid the siting of dwellings and public service infrastructure in safeguard zones of drinking water sources.

The provided general mitigation measures for attaining the objective (10) 'Provide people with a safe supply of wholesome drinking water in sufficient quantities' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed in particular when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: the client/investor, the contractor for spatial documentation and the contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[ZD05] Access to drinking water: This indicator shows the number and percentage of inhabitants of the Republic of Slovenia who are supplied with drinking water from drinking water supply systems that were included in drinking water monitoring.

-[VD08] Drinking water quality: This indicator shows the percentage of non-compliant drinking water samples due to microbiological and chemical pollution, by size classes of drinking water supply areas. With regard to microbiological pollution, the indicator shows faecal pollution (presence of the *E. coli* bacteria); with regard to chemical pollution, it shows chemical parameters that are relevant for human health (stated in Appendix I, Part B of the Rules on Drinking Water: Chemical Parameters). In addition to the non-compliance of samples, the indicator also shows the number of people exposed to exceeded concentrations of pesticides and nitrates.

- Indicator of unsuitable protection of a drinking water source: number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Water Act.

1.3 GUIDELINES FOR RURAL DEVELOPMENT

Guidelines for rural development address the reduction and prevention of adverse effects on human health from the aspect of *safely supplying people with wholesome drinking water in sufficient quantities* with the following guidelines for rural development:

- access of people to basic services of general interest is ensured through a suitable and sufficient level of supply in centres and other settlements that are significant for the development of the region and are determined in the regional spatial development plan;
- water is crucial for the functioning of natural ecosystems and biodiversity, agriculture, drinking water supply to people, electricity generation, the business sector, recreation and tourism, and the quality of the living environment in towns and cities, and the identity of space;
- ensuring high-quality drinking water for residents takes priority over other economic water uses. Water must be used with considerable concern for the recharging and long-term protection aquifers, which is the responsibility of the state;
- in karst areas with a low soil self-cleaning ability, karstic floods and occasional or frequent water scarcity, local communities are provided assistance to devise innovative solutions for water supply and waste discharge, particularly as support for rural development;
- to resolve differences between uses in safeguard zones, options for complementary uses or uses that preserve the quality of a protected water resource are sought as a priority.
- new development of activities is only planned in areas where an appropriate supply of users with drinking water is possible without major spatial interventions. When planning social development, the impacts of the foreseen new arrangement (e.g. tourism, processing industry) on the price of services of general economic interest or social costs (the provision of drinking water to people or the provision of additional capacities in local communities) are to be verified beforehand.

The descriptions and impact assessments stated in point 1.1 of this chapter for guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of guidelines for rural development on the reduction and prevention of adverse effects on human health from the aspect of *safely supplying people with wholesome drinking water in sufficient quantities*.

Guidelines for rural development have a positive impact on the provision of a safe supply of wholesome drinking water to people in sufficient quantities (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

Guidelines for green infrastructure at a regional and local level address the reduction and prevention of adverse effects on human health from the aspect of *safely supplying people with wholesome drinking water in sufficient quantities* with the following guidelines:

- connectivity to other regional green systems and the green systems of settlements is ensured within the planning of a green system for the region. Existing landscape elements used to ensure the ecological connectivity of ecosystems, the conditions for their preservation, and guidelines for establishing missing connectivity are defined. Forest, agricultural, or water land and other open spaces (e.g. endangered or protected areas, such as floodplains, *water protection areas*, protected areas) that can contribute to carrying out the multifunctional role of a green system can be included into the green system of a region. When planning land allocation, the activities that can ensure synergies with others or can be integrated with one another and support each other in terms of ensuring spatial multi-functionality have priority.

Green infrastructure is a successfully tested tool for providing ecological, economic, and social benefits through natural solutions. Green infrastructure is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, are consciously integrated into spatial planning and territorial development. Compared to single-purpose, grey infrastructure, green infrastructure has many benefits. It is not a constraint on territorial development, instead it promotes natural solutions if they are the best option. It can sometimes offer an alternative, or be complementary, to standard grey solutions.⁶⁶

Regarding impacts on human health, green infrastructure also provides cost-effective options for better implementation of Directive 98/83/EC on drinking water and Directive 2006/118/EC on groundwater. Green infrastructure solutions are particularly important in urban environments. Green infrastructure features in cities deliver health-related benefits such as clean air and better water quality.

The significance of green infrastructure for the provision of wholesome water in sufficient quantities is particularly pointed out in the European Parliament Resolution on Green Infrastructure⁶⁷ which welcomes the initiative to promote green infrastructure as an instrument that *contributes to water filtration, the prevention of erosion and the preservation of the water table, and consequently the correct implementation of the Water Framework Directive, the Floods Directive and relevant water legislation as proposed in the blueprint, as well as to integrated coastal management and marine spatial planning.*

Guidelines for green infrastructure at regional and local levels have a positive impact (grade A) on the provision of a safe supply of wholesome drinking water to people in sufficient quantities (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND APPLICATIONS

1.5.1 Guidelines for developing the sea and the coast

The guidelines for developing the sea and the coast address the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities* through the following guidelines from the group of guidelines for developing the sea and the coast:

- the development strategies of the coast or tourism in the coastal area, which are a part of regional or local development and spatial planning documents, must, as a priority, include

⁶⁶ Summarised on the basis of COM(2013) 249 final, Commission Communication: Green Infrastructure (GI) — Enhancing Europe’s Natural Capital.

⁶⁷ European Parliament Resolution of 12 December 2013 on Green Infrastructure — Enhancing Europe’s Natural Capital (2013/2663(RSP)).

activities related to adapting to climate change, particularly in the development and planning of settlements and green infrastructure, port activities, and activities for managing natural resources. Solutions must use an integral method to address the adaptation of settlement areas to sea level rise, more droughts, *lack of drinking water and water for business*, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services.

The guidelines for developing the sea and the coast contribute to safely supplying the population with wholesome drinking water in sufficient quantities.

1.5.2 Guidelines for tourist areas

The guidelines for tourist areas address the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities* through the following guidelines, from the group of guidelines for tourist areas:

- sustainable tourism development is supported; it is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility. The basic spatial planning guideline for the development of tourism is not to open new areas for tourism, especially in nature conservation areas and quiet nature zones as well as in endangered, sensitive, or water-scarce areas, such as karst areas of southern and south-eastern Slovenia and areas in north-eastern Slovenia. In terms of spatial planning, the development of tourist infrastructure should focus on areas where key tourist infrastructure has already been provided, whereby its further development should focus on the unburdening, reconstructing, and modernising existing tourist capacities in terms of increased quality of accommodations, services, and programmes, reduced water consumption and waste, and improved infrastructure and services for sustainable mobility, even for the last kilometre. Tourism development must not put resources and their quality at risk or irreversibly change them, either through infrastructure or due to visits;
- tourism in towns and cities affects the quality of life of the local population, the prices of apartments and other real estate and services, so its development must be harmonised with the needs of the local population and the preservation of the quality of everyday life. The increased use of natural resources or services in towns and cities (*water supply*, discharging water, waste, food, passenger transport) must not affect the price of these services for the population. The scope of tourism in towns and cities must be limited to a level that still enables the affordability of apartments for the local population and the preservation of the residential function of city/town centres.

The guidelines for tourist areas contribute to safely supplying the population with wholesome drinking water in sufficient quantities as a result of further tourism development.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

1.5.4 Guidelines for nature protection areas and cultural heritage areas

The guidelines for preserving and improving the recognisability of settlements and the landscape and the guidelines for nature protection areas and cultural heritage areas do not affect human health from the perspective of safely supplying the population with wholesome drinking water in sufficient quantities.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guidelines for providing spatial capacities for a low-carbon society have an indirect and a direct effect on reducing and preventing adverse effects on human health from the perspective of *safely*

supplying the population with wholesome drinking water in sufficient quantities because they encourage:

- greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry, and the economy, tourism, agriculture, public administration, and households,
- the provision of spatial planning options for the use of renewable energy sources with the purpose of increasing their proportion in the primary energy balance in the country,
- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts from all of the sub-groups from the *guidelines for special areas and applications* affecting the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities*.

The comprehensive assessment of the impact that the guidelines for special areas and applications have on the safe supply of the population with wholesome drinking water in sufficient quantities: the guidelines for special areas and applications have a positive effect on ensuring that the population receives a safe supply of wholesome drinking water in sufficient quantities.

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The guidelines for developing transport infrastructure address the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities* through the following guidelines:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, are developed in accordance with the polycentric urban system in Slovenia;
- the design of regional inter-modal centres (the development of transport logistics) which are connected to centres at levels I and II or to wider urban areas and other areas with functional connections;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing transport infrastructure affecting the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities*.

In addition to the above descriptions and impact assessments, the following additional descriptions and impact assessments are given in regard to the impacts of the guidelines for developing transport infrastructure affecting the *safe supply of the population with wholesome drinking water in sufficient*

addition to the non-compliance of samples, the indicator also shows the number of people exposed to exceeded concentrations of pesticides and nitrates.

- Indicator of unsuitable protection of a drinking water source: number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Waters Act.

Clarification regarding the selection of indicator for status monitoring

The indicators for monitoring the achievement of environmental objective 10 “Ensuring the safe supply of the population with wholesome drinking water in sufficient quantities” have been selected on the basis of the facts arising from Slovenia's reporting obligation concerning the fulfilment of the requirements of Directive 98/83/EC on drinking water. A third indicator (**Indicator of unsuitable protection of drinking water**) has been added to the first two indicators (the ‘**Access to drinking water**’ indicator and the ‘**Drinking water quality**’ indicator) which arise from Directive 98/83/EC on drinking water and have also been selected in this environmental report as indicators regarding the status of the supply of the population with drinking water; the said third indicator is a response to the Commission’s complaint that Slovenia has failed to report on the causes for the measured non-compliance of the wholesomeness of drinking water with the standards referred to in Directive 98/83/EC on drinking water and on the action plans for the elimination of these non-compliances. It has been assessed that it was the unsuitable legal regime in water protection areas, which are governed by municipal regulations, and insufficient inspection control in these areas that are the greatest contributors to the improper implementation of the measures for protecting drinking water sources.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing energy infrastructure in support of a transition into a low-carbon society affecting the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities*.

In addition to the above descriptions and impact assessments, the following additional descriptions and impact assessments are given in regard to the impacts of the guidelines for developing energy infrastructure to support a transition into a low-carbon society on the *supply of the population with wholesome drinking water in sufficient quantities*: the supply of the population with wholesome drinking water in sufficient quantities can be affected by technologies for the use of geothermal energy and the heat of shallow aquifers that use groundwater or the ground as a geothermal source of heat. Due to the utilisation of geothermal heat sources, the actual effect of the impacts on the water intended for water supply depends on:

- the type of the geothermal heat source (shallow geothermal sources, low-enthalpy hydrothermal source, high-enthalpy hydrothermal source);
- the location of the geothermal heat source;
- the duration of individual phases of the building or decommissioning of the system for the utilisation of the geothermal heat source;
- the sensitivity of the receiver of adverse impacts; and
- pressures on the current status of the aquatic environment by other types of activities in the area of influence of the utilisation of the geothermal heat source.

We assess that the impact of the guidelines for developing energy infrastructure to support a transition into a low-carbon society on the supply of the population with wholesome drinking water in sufficient quantities is insignificant under the conditions (grade C).

General mitigating measures of the guidelines for developing energy infrastructure to support a transition into a low-carbon society for achieving the goal of providing people with a safe supply of wholesome drinking water in sufficient quantities:

With the purpose of reducing the effect of impacts on groundwater due to the use of geothermal heat sources, the following policies must be observed when using shallow geothermal sources and low-enthalpy hydrothermal sources:

- the capacity, rate of flow and quality of the groundwater aquifer must be maintained when utilising geothermal water,
- systems without re-injection are not permissible in the water protection areas,
- facilities for utilising renewable and low-carbon energy sources and accompanying infrastructure must not be sited in areas with incredibly high, very high, or high-level aquifer vulnerability, and
- facilities for utilising renewable and low-carbon energy sources and accompanying infrastructure is also not placed in water protection areas of drinking water sources.

The provided general mitigation measures for attaining the goal (10) 'Provide people with a safe supply of wholesome drinking water in sufficient quantities' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

-[ZD05] Access to drinking water: This indicator shows the number and percentage of inhabitants of the Republic of Slovenia who are supplied with drinking water from drinking water supply systems that were included in drinking water monitoring.

-[VD08] Drinking water quality: This indicator shows the percentage of non-compliant drinking water samples due to microbiological and chemical pollution, by size classes of drinking water supply areas. With regard to microbiological pollution, the indicator shows faecal pollution (presence of the *E. coli* bacteria); with regard to chemical pollution, it shows chemical parameters that are relevant for human health (stated in Appendix I, Part B of the Rules on Drinking Water: Chemical Parameters). In addition to the non-compliance of samples, the indicator also shows the number of people exposed to exceeded concentrations of pesticides and nitrates.

- Indicator of unsuitable protection of a drinking water source: number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Waters Act.

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

The guidelines for energy networks do not have any impact on human health from the perspective of safely supplying the population with wholesome drinking water in sufficient quantities.

The guidelines for energy networks do not have any impact (grade A) on the safe supply of the population with wholesome drinking water in sufficient quantities.

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

The guidelines for protecting and supplying mineral raw materials do not have any impact on human health from the perspective of safely supplying the population with wholesome drinking water in sufficient quantities.

The guidelines for protecting and supplying mineral raw materials do not have any impact (grade A) on the safe supply of the population with wholesome drinking water in sufficient quantities.

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for rural development, agriculture, forestry, and fisheries affecting the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities.*

The guidelines for rural development, agriculture, forestry, and fisheries do not have any impact (grade A) on the safe supply of the population with wholesome drinking water in sufficient quantities.

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *The guidelines for nature conservation do not have a direct effect on the safe supply of the population with wholesome drinking water in sufficient quantities (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on the safe supply of the population with wholesome drinking water in sufficient quantities (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *The guidelines for defence activities do not have a direct effect on the safe supply of the population with wholesome drinking water in sufficient quantities (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *The guidelines for preventive protection against natural and other disasters do not have a direct effect on the safe supply of the population with wholesome drinking water in sufficient quantities (grade A).*

Environmental objective 11: Reducing the exposure of people to polluted air

Set 1 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The guidelines for planning and developing settlements address the reduction and prevention of adverse effects on human health from the perspective of exposure to polluted air with the following guidelines for planning and developing settlements:

- the quality of life in settlements is raised by: improving the *access to services of general interest and general economic significance*, access to housing and jobs through sustainable mobility methods and by reducing mobility needs (improving the possibility of working from home); by reducing living costs in towns and cities, particularly through *energy efficient construction and cascading use of energy* at the level of buildings or settlements; by improving the possibilities for at least a 5-minute accessibility on foot to green areas and outdoor recreation; by *reducing noise levels in settlements*, e.g. by encouraging the use of less noisy means of transportation; by reducing or adjusting *night lighting*, particularly along roads and in the immediate vicinity of dwellings, hospitals, social institutions, especially in areas with landscape recognisability, in broader protected areas and cultural heritage areas; by *improving air quality in settlements, reducing emissions from combustion plants and means of transportation*, and by improving the structure, type, and size of green areas and their maintenance as factors that *buffer emissions and improve air quality*.
- to improve the recognisability of settlements and the landscape and enable ecological connectivity, separative green belts are introduced between settlements as part of a settlement's green system that connects to the green system of the region. Green belts can include forests, *aquatic and riparian areas*, agricultural land with extensive use, and protected

nature areas. The width of green belts is determined depending on the role of a green belt for ecological connectivity (wildlife migration paths), recreational role, *climate role (average wind speed)*, and the image of the landscape, but they should not be narrower than 200 metres (1000 metres for wildlife migration paths). If they are narrower, they should be kept in a limited scope. No permanent actions affecting separative belts should be carried out, which could reduce or defy their purpose;

- in broader urban areas, other areas for functional integration, and in places with denser settlement, priority planning for systems for the district heating and cooling of buildings through *renewable or CO₂-neutral energy sources* is carried out with the goal of streamlining costs and *improving air quality in settlements*. The construction of district heating systems using heat produced through cogeneration is encouraged. There is also priority planning for these systems in areas with dense settlement (more than 20 people per hectare), in areas with greater density of users (schools, multi-family dwellings, dormitories, nursing homes, shopping centres, etc.) or in economic zones with ensured consumption of thermal energy. In areas that are connected to a gas network or which can still be connected to an existing gas network if reasonable investments are made, energy supply relies on these networks.
- economic or business zones are sited in settlements along traffic hubs, so that they are mainly well-connected to public transport from all areas of the region and neighbouring regions. When locations are selected, it is verified whether the renewal and renovation of abandoned industrial, municipal, transport, and similar brownfield areas are possible. Areas for economic development must, as a whole and as individual parts, show *environmental sustainability, i.e. material, energy, and spatial efficiency*, and they must operate according to the principle of industrial symbioses and have a large proportion of green areas as an element contributing to good working conditions, adaptation to climate change, and mitigating visible or *environmental impacts (such as noise)*.

Impact on reducing the exposure to polluted air: this legislative package for clean air that the Commission published at the end of 2013 with the purpose of reducing air pollution in the EU contains a report on the Clean Air for Europe⁶⁸ programme and three legislative acts on emissions and air pollution: Directive on national emission ceilings for six pollutants, Directive on the limitation of pollution from medium combustion plants, and the approval of the amended international rules on long-range transboundary air pollution (Gothenburg Protocol) at the EU level. The clean air legislative package determines the goals for reducing the impacts of air pollution on health and the environment by 2030 and contains legislative measures for carrying out stricter emission and air pollution standards.

With regard to the presentation of the ‘Clean Air for Europe’ programme, the Commission highlighted that the toll taken on the population due to poor air quality was worse than with road traffic accidents; for this reason, the ambient air pollution is the most significant environmental cause of premature mortality in the EU. Furthermore, air pollution affects the quality of life due to asthma or respiratory issues. Air pollution also causes lost working days and high health care costs, whereby vulnerable groups, such as children, asthma patients, and the elderly are the most affected. It also harms ecosystems due to excessive nitrogen pollution (eutrophication) and acid rain. The direct costs incurred by society due to air pollution, including the damage caused to crops and buildings, are extremely high in the EU (EUR 23 billion per year).

Just like in most member states, quality of life has been excessively impaired in some areas of Slovenia due to the exposure to polluted air, as ambient air quality standards related to the concentration of particles and the concentration of ozone in the air have not yet been met.

⁶⁸ COM(2013) 918 final, Commission Communication: ‘Clean Air for Europe’ Programme.

The situation related to the excessive ambient air pollution with particles is especially grave in the areas of some urban municipalities and basins during winter due to low wind speeds and the more common use of technologically unsuitable biomass heating systems.

By transposing EU legislation into its own legislation, Slovenia set the goal of achieving the level of air quality that would not cause adverse effects and risks to human health and the environment. In order to reach this goal, effective air quality policies also require that measures be taken in the spatial planning and development of settlements.

In the 2017–2018 period, the European Commission drafted two mobility packages, which are indirectly and directly supported by these guidelines for planning and developing settlements. The first mobility package refers to charging and extending the use of road charges⁶⁹, while the second mobility package includes measures to promote a more connected and cleaner public transport, to re-direct long-distance goods transport from the road to the railways, inland waterways, or short sea shipping, and to facilitate the transition towards low-emission and zero-emission vehicles through new standards for CO₂ emissions for cars and delivery vehicles and through public contracts⁷⁰, mainly for zero-emission urban buses. The European Commission is also drafting non-binding guidelines with recommendations and best practices which will help local communities address various perspectives concerning the limited access to towns and cities for vehicles.

The exposure of people to polluted air in Slovenia's towns and cities in winter is mostly impacted by the use of biomass in small combustion plants. Although emissions from small combustion plants into the air are regulated by law⁷¹ and there is a system for regularly monitoring the proper operation of these plants during the performance of what is known as chimney-sweeping public services, the operation of small biomass combustion plants is far from what is prescribed due to the complete absence of any inspection control.

Only the consistent implementation of the following measures can contribute to the prevention of harmful effects on human health due to the exposure to air pollution caused by the use of wood biomass as a renewable energy source in the urban environment:

- establishing new district heating systems using biomass because this method for heating buildings is more energy efficient and, due to lesser emissions of pollutants, more environmentally acceptable than heating buildings using individual heat production in small combustion plants,
- promoting the replacement of existing small combustion plants using biomass with new ones, the emissions of which are in accordance with the prescribed standards for emissions from small combustion plants, and
- establishing cogeneration systems using wood biomass as a renewable energy source because this heat and power production method is more energy efficient and, due to lesser emissions of pollutants, more environmentally acceptable than the separate production of heat and electrical power.

The guidelines for planning and developing settlements suitably define the set of measures to be taken to solve urban challenges related to reducing ambient air pollution, whereby the most important guidelines are the ones related to the introduction of sustainable mobility and the priority planning of district heating and cooling systems using renewable and CO₂-neutral energy sources.

⁶⁹ Directive amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures (COM(2017) 275).

⁷⁰ Directive amending Directive 2009/33/EU on the promotion of clean and energy-efficient road transport vehicles – COM(2017) 653.

⁷¹ Decree on the emission of substances into the atmosphere from small and medium combustion plants (Official Gazette of the Republic of Slovenia [Uradni list RS], No 24/13, 2/15, 50/16, and 17/18).

Guidelines for planning and developing settlements have a positive impact on reducing the exposure of people to polluted air (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Urban development of towns and other urban settlements is crucial for the improvement of the economic, social and environmental efficiency of the state. Urban settlements are the most important elements in urban development, whose population density increases with renovations or expansions in accordance with the guidelines for urban development. The guidelines for urban development address the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution* with the following guidelines for urban development:

- urban development ensures the distribution of activities, social infrastructure, dwellings, and economic infrastructure to urban settlements, the provision of utility infrastructure for residential and production purposes, *supply and services* in suitable locations, and areas for recreation and spending free time outdoors,
- the development opportunities and challenges that towns and cities are facing with go beyond their physical boundaries, so urban development supports the coordinated and interconnected development of towns and cities, other urban settlements, and broader urban areas,
- urban settlements are the most significant building block in urban development. They are being developed into a vibrant, cohesive, and well-developed environment providing conditions for economic and social development and contributing to the *quality of life of the entire population*. They are being developed according to the principle of multi-functionality, and the principle of complementarity is used to promote the mixed use of space. In order to develop an efficient town or city, a suitable ratio between the use of land and buildings is provided, and efforts are made to ensure a mix of various functions and activities,
- the issue of the Ljubljana railway hub is being handled as a priority, so that the suitable rail capacity can be ensured to increase the flow of passenger and goods transport and to raise the quality of life of the population *by reducing noise levels and other environmental emissions*.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for urban development affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution*.

Guidelines for urban development have a positive impact on reducing the exposure of people to polluted air (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The guidelines for rural development address the reduction and prevention of adverse effects on human health from the perspective of exposure to air pollution with the following guidelines for rural development:

- access of people to basic services of general interest is ensured through a suitable and sufficient level of supply in centres and other settlements that are significant for the development of the region and are determined in the regional spatial development plan;
- major agricultural facilities that are considered to be facilities affecting the environment due to *noise* or stench are sited or relocated to areas with manufacturing activities or areas outside of compact settlements on the basis of a comprehensive spatial-development and environmental assessment. For agricultural production in which the production method is not directly related to agricultural land (e.g. greenhouses), degraded brownfield areas in settlements, particularly near roads, which are not suitable for building dwellings or business premises, or

environmentally degraded areas, provided that they do not pose a health risk for carrying out such activities, are to be used as a priority.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for rural development affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution*.

Guidelines for rural development have a positive impact on reducing the exposure of people to polluted air (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The guidelines for green infrastructure at a regional and local level address the reduction and prevention of adverse effects on human health from the perspective of *exposure to polluted air* with the following guidelines for planning and developing settlements:

- connectivity to other regional green systems and the green systems of settlements is ensured within the planning of a green system for the region. Existing landscape elements used to ensure the ecological connectivity of ecosystems, the conditions for their preservation, and guidelines for establishing missing connectivity are defined. Forest, agricultural, or water land and other open spaces (e.g. endangered or protected areas, such as floodplains, *water protection areas*, protected areas) that can contribute to carrying out the multifunctional role of a green system can be included into the green system of a region. When planning land allocation, the activities that can ensure synergies with others or can be integrated with one another and support each other in terms of ensuring spatial multi-functionality have priority.

Green infrastructure is a successfully tested tool for providing ecological, economic, and social benefits through natural solutions. Green Infrastructure is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, are consciously integrated into spatial planning and territorial development. Compared to single-purpose, grey infrastructure, green infrastructure has many benefits. It is not a constraint on territorial development but promotes natural solutions if they are the best option. It can sometimes offer an alternative, or be complementary, to standard grey solutions.⁷²

Green infrastructure features in cities deliver health-related benefits such as clean air and better water quality. Healthy ecosystems also reduce the spread of vector-borne⁷³ diseases. Implementing Green Infrastructure features in urban areas creates a greater sense of community, strengthens the link with voluntary actions undertaken by civil society, and helps combat social exclusion and isolation. They benefit the individual and the community physically, psychologically, emotionally and socio-economically. Green infrastructure creates opportunities to connect urban and rural areas and provides appealing places to live and work in⁷⁴.

Guidelines for green infrastructure at a regional and local level have a positive impact on reducing the exposure of people to polluted air (grade A).

⁷² Summarised on the basis of COM(2013) 249 final, Commission Communication: Green Infrastructure (GI) — Enhancing Europe’s Natural Capital.

⁷³ Diseases transmitted by ticks and other arthropods.

⁷⁴ Reports, studies, and evaluation supported by COM(2013) 249 final of the European Commission: <http://ec.europa.eu/environment/nature/ecosystems/studies.htm>.

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and the coast

The guidelines for developing the sea and the coast address the reduction and prevention of adverse effects on human health from the perspective of exposure to air pollution through the following guidelines from the group of guidelines for developing the sea and the coast:

- the development strategies of the coast or tourism in the coastal area, which are a part of regional or local development and spatial planning documents, must, as a priority, include activities related to adapting to climate change, particularly in the development and planning of settlements and green infrastructure, port activities, and activities for managing natural resources. Solutions must use an integral method to address the adaptation of settlement areas to sea level rise, more droughts, *lack of drinking water and water for business*, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services.

1.5.2 Guidelines for tourist areas

The guidelines for tourist areas address the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution* through the following guidelines from the group of guidelines for tourist areas:

- sustainable tourism development is supported; it is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility. The basic spatial planning guideline for the development of tourism is not to open new areas for tourism, especially in nature conservation areas and quiet nature zones as well as in endangered, sensitive, or water-scarce areas, such as karst areas of southern and south-eastern Slovenia and areas in north-eastern Slovenia. In terms of spatial planning, the development of tourist infrastructure should focus on areas where key tourist infrastructure has already been provided, whereby its further development should focus on the unburdening, reconstructing, and modernising existing tourist capacities in terms of increased quality of accommodations, services, and programmes, reduced water consumption and waste, and improved infrastructure and services for sustainable mobility, even for the last kilometre. Tourism development must not put resources and their quality at risk or irreversibly change them, either through infrastructure or due to visits.

As tourist areas are developed, the number of visitors increases and, as a result, traffic increases and consequently so does the exposure of people to polluted air. Furthermore, tourism development requires suitable infrastructure that contributes to the additional pollution of ambient air. The SDSS guidelines for tourism development encourage and implement sustainable mobility and strive for ensuring accessibility to tourist areas with sustainable mobility. The development of tourist infrastructure directs visitors to areas with already provided key tourist infrastructure and does not introduce new areas for tourism.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

1.5.4 Guidelines for nature protection areas and cultural heritage areas

The guidelines for preserving and improving the recognisability of settlements and the landscape and the guidelines for nature protection areas and cultural heritage areas do not affect human health from the perspective of exposure to air pollution.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guidelines for providing spatial capacities for a low-carbon society have an indirect and a direct effect on reducing and preventing adverse effects on human health from the perspective of *exposure to air pollution* because they encourage:

- greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry, and the economy, tourism, agriculture, public administration, and households,
- the provision of spatial capacities for the use of renewable energy sources with the purpose of increasing their proportion in the primary energy balance in the country, including promoting the use of renewable gases in the gas network,
- the energy design of regions, towns and cities, and local communities that is based on local energy self-supply from renewable sources and the sufficient capacity of smart distribution networks,
- local business models for producing energy from renewable sources (e.g. energy community) that contribute to local supply,
- in areas with sufficiently large consumption, the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, and
- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts from all of the sub-groups from the *guidelines for special areas and applications* affecting the reduction and prevention of adverse effects on human health from the perspective of exposure to *air pollution*.

The comprehensive assessment of the impacts of the guidelines for special areas and applications on the exposure of people to air pollution: the guidelines for special areas and application have a positive impact on reducing the exposure of people to polluted air (grade A).

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The guidelines for developing transport infrastructure address the reduction and prevention of adverse effects on human health from the perspective of *exposure to polluted air* with the following guidelines:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, are developed in accordance with the polycentric urban system in Slovenia;
- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling, use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes which connect urban centres and tourist settlements, and are connected to the long-distance European cycling connections which run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;

- the design of regional inter-modal centres (the development of transport logistics) which are connected to centres at levels I and II or to wider urban areas and other areas with functional connections;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing transport infrastructure affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution*.

Guidelines for developing transport infrastructure have a positive impact on reducing the exposure of people to polluted air (grade A).

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing energy infrastructure in support of a transition into a low-carbon society affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution*.

In addition to the above descriptions and assessments, the following additional descriptions and impact assessments are given with regard to the impacts of the guidelines for developing energy infrastructure in support of a transition into a low-carbon society on the *exposure of people to air pollution*: particularly the following guidelines have a direct impact on reducing the exposure of people to air pollution:

- encouraging greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry, and the economy, tourism, agriculture, public administration, and households,
- replacing fossil fuels by using technologically and economically exploitable potentials of renewable sources,
- supporting local business models for producing energy from renewable sources that contribute to local supply, particularly in mountain areas and remote areas,
- encouraging the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, in areas with a sufficiently large consumption.

Guidelines for developing energy infrastructure in support of a transition into a low-carbon society have a positive impact on reducing the exposure of people to polluted air (grade A).

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the

guidelines for energy networks affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution*.

Guidelines for energy networks do not have an impact or have a positive impact on reducing the exposure of people to polluted air (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous mineral raw materials to the state. The utilisation of indigenous mineral raw materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant mineral raw materials primarily refers to the utilisation of mineral raw materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of mineral raw materials in construction is expected to be reduced.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for protecting and supplying mineral raw materials affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to air pollution*.

Guidelines for protecting and supplying mineral raw materials do not have an impact or have a positive impact on reducing the exposure of people to polluted air (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

Guidelines for rural development, agriculture, forestry and fisheries do not have an impact on reducing the exposure of people to polluted air (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on reducing the exposure of people to air pollution (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on reducing the exposure of people to polluted air (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities do not have a direct impact on reducing the exposure of people to air pollution (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters do not have a direct impact on reducing the exposure of people to air pollution (grade A).*

Indicators for status monitoring:

-[ZR11] **Air quality:** The indicator shows excessive limit values of sulphur dioxide (SO₂), particles (PM₁₀), ozone (O₃), and nitrogen dioxide (NO₂) in the 1992–2006 period.

-[ZR08] **Air pollution by PM₁₀ and PM_{2.5} particulate matter:** the indicator displays the number of days when daily ceiling concentration of PM₁₀ of 50 µg/m³, movement of average annual concentration of PM₁₀ and PM_{2.5}, and average exposure to PM_{2.5} particles.

-[ZR07] **Air pollution by ozone:** This indicator shows the number of days with exceeded ozone target value and the number of hours with exceeded information value within a calendar year.

Environmental objective 12: Reduce the exposure of people to excessive noise levels

Set 1 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The guidelines for planning and developing settlements address the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise* with the following guidelines for planning and developing settlements:

- the quality of life in settlements is raised by: improving the *access to services of general interest and general economic significance*, access to housing and jobs through sustainable mobility methods and by reducing mobility needs (improving the possibility of working from home); by reducing living costs in towns and cities, particularly through *energy efficient*

construction and cascading use of energy at the level of buildings or settlements; by improving the possibilities for at least a 5-minute accessibility on foot to green areas and outdoor recreation; by *reducing noise levels in settlements*, e.g. by encouraging the use of less noisy means of transportation; by reducing or adjusting *night lighting*, particularly along roads and in the immediate vicinity of dwellings, hospitals, social institutions, especially in areas with landscape recognisability, in broader protected areas and cultural heritage areas; by *improving air quality in settlements, reducing emissions from combustion plants and means of transportation*, and by improving the structure, type, and size of green areas and their maintenance as factors that *buffer emissions and improve air quality*.

- to improve the recognisability of settlements and the landscape and enable ecological connectivity, separative green belts are introduced between settlements as part of a settlement's green system that connects to the green system of the region. Green belts can include forests, *aquatic and riparian areas*, agricultural land with extensive use, and protected nature areas. The width of green belts is determined depending on the role of a green belt for ecological connectivity (wildlife migration paths), recreational role, *climate role (average wind speed)*, and the image of the landscape, but they should not be narrower than 200 metres (1000 metres for wildlife migration paths). If they are narrower, they should be kept in a limited scope. No permanent actions affecting separative belts should be carried out, which could reduce or defy their purpose;
- economic or business zones are sited in settlements along traffic hubs, so that they are mainly well-connected to public transport from all areas of the region and neighbouring regions. When locations are selected, it is verified whether the renewal and renovation of abandoned industrial, municipal, transport, and similar brownfield areas are possible. Areas for economic development must, as a whole and as individual parts, show *environmental sustainability, i.e. material, energy, and spatial efficiency*, and they must operate according to the principle of industrial symbioses and have a large proportion of green areas as an element contributing to good working conditions, adaptation to climate change, and mitigating visible or *environmental impacts (such as noise)*.

The impact on reducing the exposure of people to excessive noise: noise pollution remains the main environmental problem in the European Union. Road traffic is the predominating source of environmental noise. Rail traffic, airports, and the industry are also a significant source of noise. With regard to managing road traffic, the measures to reduce the exposure of people to excessive noise are most frequently carried out in towns and cities. Such measures include the replacement of road surfaces, the improvement of traffic flows, and the introduction of lower speed limits.

The 7th Environment Action Programme⁷⁵ sets forth the objective that noise pollution will significantly decrease in the EU by 2020 and come close to the level recommended by the World Health Organisation (WHO). With regard to noise reduction, the measures of the 7th EU Environment Action Programme mainly refer to:

- implementing an updated Union noise policy, aligned with the latest scientific knowledge,
- measures to reduce noise at source, and
- including improvements in city design.

Directive 2002/49/EC relating to the assessment and management of environmental noise is the main EU legislative act for determining noise levels and taking the necessary measures at the level of member states and at the EU level. Directive 2002/49/EC relating to environmental noise focuses on three areas:

- the determination of exposure to environmental noise,

⁷⁵ Decision No 1386/2013/EU on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.

- ensuring that information on environmental noise and its effects is made available to the public
- preventing and reducing environmental noise where necessary and preserving environmental noise quality where it is good.

This Directive shall apply to environmental noise to which humans are exposed in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas. It is important to note that the Directive does not set forth limit values or target values, not does it determine the measures that are to be included in action plans, because this is left up to the competent authorities in member states.

In 2014, the European Environment Agency (EEA) published its first Europe-wide assessment on environmental noise – Noise in Europe 2014. This assessment was based on the data reported by member states to the EEA pursuant to Directive 2002/49/EC on environmental noise. These are data on noise mapping for 2012. Available data on long-term average exposure show that 65% of Europeans who live in urban areas were exposed to high levels of noise⁷⁶, more than 20% of them to noise levels at night, due to which adverse effects on health often occur.

WHO has categorised noise due to road traffic as the second most harmful environmental stress in Europe, with only air pollution ranking worse. WHO guidelines regarding night-time noise for Europe recommend that exposure should not exceed 40 dB(A). Achieving such a low sound pressure poses a challenge, especially in urban areas, where background noise levels remain relatively high even at night. Directive 2002/49/EC on environmental noise does not currently require for night-time noise mapping to be carried out at a level as low as 40 dB(A), so that the pollution of ambient environment with noise is assessed at 55 dB(A) during the *Lday* period and at 50 dB(A) during the *Lnight* period.

In order to reduce the exposure of people to excessive noise, other measures are also required and not only measures for reducing noise emissions. One of the main conclusions of the EEA report for 2016 was the preservation of what is known as quiet areas in towns, cities and in open space⁷⁷. The EEA 2016 report found that, despite some measures for preserving quiet areas in open space have been taken, a lot can still be done to reduce noise pollution and to help protect human health and biodiversity. According to the report, approximately 18% of European territory outside of cities can be considered quiet areas, while 33% of areas in open country are excessively burdened by noise. The distribution of quiet areas in open country is very connected to population density and the location of transport infrastructure.

Pursuant to Directive 2002/49/EC relating to the assessment and management of environmental noise, Slovenia must draft and publish action plans for noise mapping, whereby it must decide on the special types of measures included in these action plans on its own. For urban agglomerations, measures related to managing road traffic, such as replacing road surfaces, improving traffic flows, and introducing lower speed limits are the most suitable. These are followed by measures related to land use and urban planning. Action plans the goal of which is to promote the use of environmentally-friendlier means of transport, avoid increases in traffic flow, and raise awareness on noise as an environmental issue are also suitable.

Pursuant to the provisions of Directive 2002/49/EC relating to the assessment and management of environmental noise, a unified approach to assessing the exposure of the exposure of people to environmental noise through noise mapping has been defined for the entire EU territory, according to methods set forth in said Directive. Member states must ensure that, every five years after 30 June 2012, strategic noise maps be made indicating the conditions for all agglomerations, main roads, and

⁷⁶ “High noise levels” are defined as noise levels in excess of 55 dBA Lden and 50 dBA Ln_{night}.

⁷⁷ EEA Report No 14/2016, Quiet areas in Europe, The environment unaffected by noise pollution.

railways within their territories. Furthermore, member states must also notify the Commission concerning all agglomerations, major roads, and railways within their territories.

It is evident from the data from action plans for the Urban Municipalities of Ljubljana⁷⁸ and Maribor⁷⁹, on which Slovenia reported in 2018 for its agglomerations⁸⁰ of Ljubljana and Maribor pursuant to Directive 2002/49/EC that, in these two urban municipalities, most people are exposed to excessive noise caused by road traffic (see figure below).

The main political objective of the 7th EU Environment Action Programme is to significantly reduce noise pollution by 2020 and come close to the noise levels recommended by the World Health Organisation. Data show that the objective of the 7th EU Environment Action Programme (to reduce environmental noise pollution by 2020 and come close to the noise levels recommended by WHO under 55 dB(A)) will be hard to achieve without taking the additional measures referred to in the preceding paragraph.

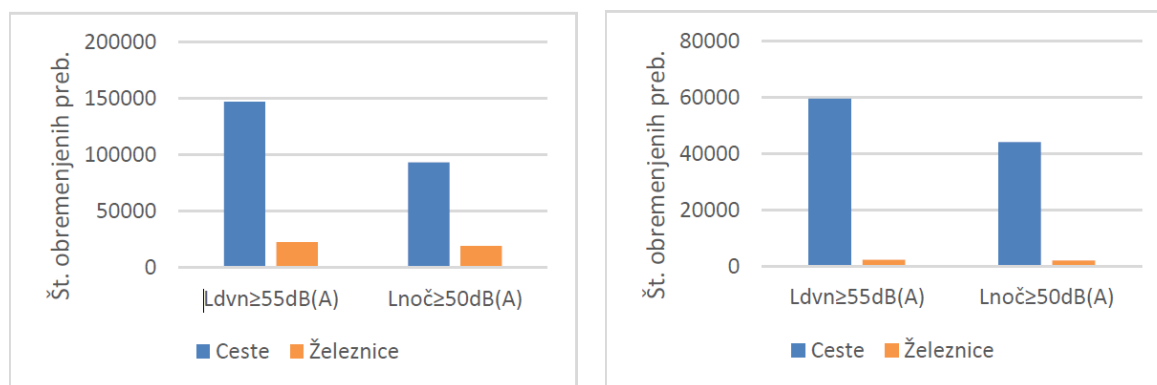


Figure 42: The number of people exposed to excessive noise – Ljubljana left, Maribor right.

Slo	Ang
Št. Obremenjenih prebivalcev	No. of burdened population
Ceste	Roads
Železnice	Railways
Ldvn	Lday
Lnoč	Lnight

It should also be noted that the expectations regarding the introduction of electric vehicles might be too great. Electric vehicles are, at least at low speeds, quieter than the conventional fuel-powered or motor vehicles, but the fact remains that, if all cars were to be replaced with electric ones, the average day-time noise level would only decrease by 2 to 3 dB(A). A simulated noise map shows that replacing vehicles with an internal combustion engine with electric vehicles could only improve the acoustic environment of an urban environment for 10% of the population at most⁸¹.

⁷⁸ Operational Programme for Noise Protection – Chapter Summary – City of Ljubljana.

http://cdr.eionet.europa.eu/si/eu/noise/colwqelhq/envwqemwa/Povzetek_OPH_-_MOL.pdf

⁷⁹ Operational Programme for Noise Protection – Chapter Summary – City of Ljubljana.

http://cdr.eionet.europa.eu/si/eu/noise/colwqelhq/envwqemwa/Povzetek_OPH_-_MOM.pdf

⁸⁰ “agglomeration”: part of a territory having a population in excess of 100000 persons and a population density such that the Member State considers it to be an urbanised area;

⁸¹ European Commission, Noise abatement approaches April 2017, Issue 17.

The guidelines for planning and developing settlements suitably define a set of measures to reduce the exposure of people to excessive noise pollution in urban areas and in open country through measures for sustainable mobility and the sustainable development of urban areas.

Guidelines for planning and developing settlements have a positive impact on reducing the exposure of people to excessive noise (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

Urban development of towns and other urban settlements is crucial for the improvement of the economic, social and environmental efficiency of the state. Urban settlements are the most important elements in urban development, whose population density increases with renovations or expansions in accordance with the guidelines for urban development. The guidelines for urban development address the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise* with the following guidelines for urban development:

- urban development ensures the distribution of activities, social infrastructure, dwellings, and economic infrastructure to urban settlements, the provision of utility infrastructure for residential and production purposes, *supply and services* in suitable locations, and areas for recreation and spending free time outdoors,
- the development opportunities and challenges that towns and cities are faced with go beyond their physical boundaries, so urban development supports the coordinated and interconnected development of towns and cities, other urban settlements, and broader urban areas,
- urban settlements are the most significant building block in urban development. They are being developed into a vibrant, cohesive, and well-developed environment providing conditions for economic and social development and contributing to the *quality of life of the entire population*. They are being developed according to the principle of multi-functionality, and the principle of complementarity is used to promote the mixed use of space. In order to develop an efficient town or city, a suitable ratio between the use of land and buildings is provided, and efforts are made to ensure a mix of various functions and activities,
- the issue of the Ljubljana railway hub is being handled as a priority, so that the suitable rail capacity can be ensured to increase the flow of passenger and goods transport and to raise the quality of life of the population *by reducing noise levels and other environmental emissions*.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for rural development, agriculture, forestry, and fisheries affecting the reduction and prevention of adverse effects on human health from the perspective of *safely supplying the population with wholesome drinking water in sufficient quantities*.

Guidelines for urban development have a positive impact on reducing the exposure of people to excessive noise (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The guidelines for rural development address the reduction and prevention of adverse effects on human health from the perspective of exposure to *excessive noise* with the following guidelines for rural development:

- access of people to basic services of general interest is ensured through a suitable and sufficient level of supply in centres and other settlements that are significant for the development of the region and are determined in the regional spatial development plan;
- major agricultural facilities that are considered to be facilities affecting the environment due to *noise* or stench are sited or relocated to areas with manufacturing activities or areas outside of

compact settlements on the basis of a comprehensive spatial-development and environmental assessment. For agricultural production in which the production method is not directly related to agricultural land (e.g. greenhouses), degraded brownfield areas in settlements, particularly near roads, which are not suitable for building dwellings or business premises, or environmentally degraded areas, provided that they do not pose a health risk for carrying out such activities, are to be used as a priority.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for rural development affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise*.

Guidelines for rural development have a positive impact on reducing the exposure of people to excessive noise (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The guidelines for green infrastructure at a regional and local level address the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise* with the following guidelines:

- connectivity to other regional green systems and the green systems of settlements is ensured within the planning of a green system for the region. Existing landscape elements used to ensure the ecological connectivity of ecosystems, the conditions for their preservation, and guidelines for establishing missing connectivity are defined. Forest, agricultural, or water land and other open spaces (e.g. endangered or protected areas, such as floodplains, *water protection areas*, protected areas) that can contribute to carrying out the multifunctional role of a green system can be included into the green system of a region. When planning land allocation, the activities that can ensure synergies with others or can be integrated with one another and support each other in terms of ensuring spatial multi-functionality have priority.

Green infrastructure is a successfully tested tool for providing ecological, economic, and social benefits through natural solutions. Green Infrastructure is based on the principle that protecting and enhancing nature and natural processes, and the many benefits human society gets from nature, are consciously integrated into spatial planning and territorial development. Compared to single-purpose, grey infrastructure, green infrastructure has many benefits. It is not a constraint on territorial development but promotes natural solutions if they are the best option. It can sometimes offer an alternative, or be complementary, to standard grey solutions.⁸²

With regard to impacts on human health, green infrastructure also offers cost-effective options for the better implementation of Directive 2002/49/EC on environmental noise, because green infrastructure solutions are significant for preventing the noise transmission caused by road traffic or rail transport in urban areas. The features of green infrastructure in towns and cities bring health benefits: in addition to ensuring clean air and better water quality, they also significantly contribute to preventing noise transmission.

Guidelines for green infrastructure at regional and local levels have a positive impact on reducing the exposure of people to excessive noise (grade A).

⁸² Summarised on the basis of COM(2013) 249 final, Commission Communication: Green Infrastructure (GI) — Enhancing Europe's Natural Capital.

1.5 GUIDELINES FOR SPECIAL AREAS AND APPLICATIONS

1.5.1 Guidelines for developing the sea and the coast

The guidelines for developing the sea and the coast address the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise* through the following guidelines from the group of guidelines for developing the sea and the coast:

- the development strategies of the coast or tourism in the coastal area, which are a part of regional or local development and spatial planning documents, must, as a priority, include activities related to adapting to climate change, particularly in the development and planning of settlements and green infrastructure, port activities, and activities for managing natural resources. Solutions must use an integral method to address the adaptation of settlement areas to sea level rise, more droughts, *lack of drinking water and water for business*, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services.

1.5.2 Guidelines for tourist areas

The guidelines for tourist areas address the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise* through the following guidelines from the group of guidelines for tourist areas:

- sustainable tourism development is supported; it is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility. The basic spatial planning guideline for the development of tourism is not to open new areas for tourism, especially in nature conservation areas and quiet nature zones as well as in endangered, sensitive, or water-scarce areas, such as karst areas of southern and south-eastern Slovenia and areas in north-eastern Slovenia. In terms of spatial planning, the development of tourist infrastructure should focus on areas where key tourist infrastructure has already been provided, whereby its further development should focus on the unburdening, reconstructing, and modernising existing tourist capacities in terms of increased quality of accommodations, services, and programmes, reduced water consumption and waste, and improved infrastructure and services for sustainable mobility, even for the last kilometre. Tourism development must not put resources and their quality at risk or irreversibly change them, either through infrastructure or due to visits;
- tourism in towns and cities affects the quality of life of the local population, the prices of apartments and other real property and services, so its development must be harmonised with the needs of the local population and the preservation of the quality of everyday life. The increased use of natural resources or services in towns and cities (*water supply*, discharging water, waste, food, passenger transport) must not affect the price of these services for the population. The scope of tourism in towns and cities must be limited to a level that still enables the affordability of apartments for the local population and the preservation of the residential function of city/town centres.

As tourist areas are developed, the number of visitors increases and, as a result, traffic increases and consequently so does the exposure of people to polluted air. Furthermore, tourism development requires suitable infrastructure that contributes to the additional pollution of ambient air. The SDSS guidelines for tourism development encourage and implement sustainable mobility and strive for ensuring accessibility to tourist areas with sustainable mobility. The development of tourist infrastructure directs visitors to areas with already provided key tourist infrastructure and does not introduce new areas for tourism.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

1.5.4 Guidelines for nature protection areas and cultural heritage areas

The guidelines for preserving and improving the recognisability of settlements and the landscape and the guidelines for nature protection areas and cultural heritage areas do not affect human health from the perspective of exposure to excessive noise.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guidelines for providing spatial capacities for a low-carbon society have an indirect or a direct effect on reducing and preventing adverse effects on human health from the perspective of *exposure to excessive noise* because they encourage:

- greater energy efficiency in developing and renewing urban and rural settlements and villages, transport, industry, and the economy, tourism, agriculture, public administration, and households,
- the provision of spatial capacities for the use of renewable energy sources with the purpose of increasing their proportion in the primary energy balance in the country, including promoting the use of renewable gases in the gas network,
- the energy design of regions, towns and cities, and local communities that is based on local energy self-supply from renewable sources and the sufficient capacity of smart distribution networks,
- local business models for producing energy from renewable sources (e.g. energy community) that contribute to local supply,
- in areas with sufficiently large consumption, the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration, and
- the selection of areas for the production of renewable energy sources, where exploitable potentials may be utilised if conditions to protect habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts from all of the sub-groups from the *guidelines for special areas and applications* affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise*.

The comprehensive assessment of the impacts of the guidelines for special areas and applications: the guidelines for special areas and application have a positive impact on reducing the exposure of people to excessive noise (grade A).

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The guidelines for developing transport infrastructure address the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise* through the following guidelines:

- corridors and entry points in the network of rail and road connections, which is functionally connected with the European transport network, are developed in accordance with the polycentric urban system in Slovenia;

- the needs of residents and visitors in Slovenia for sustainable mobility while reducing traffic and adverse effects of traffic on the environment. Sustainable mobility includes walking, cycling, use of public passenger transport. When planning, sustainable mobility is provided with the integration of spatial (urban) and transport planning at all levels;
- the design of a cycling network comprises a network of national long-distance cycling routes which connect urban centres and tourist settlements, and are connected to the long-distance European cycling connections which run through Slovenia;
- the design of a hiking trail, which comprises mountain and themed hiking trails in urban and rural areas;
- the design of regional inter-modal centres (the development of transport logistics) which are connected to centres at levels I and II or to wider urban areas and other areas with functional connections;
- transport infrastructure is planned so that issues of accessibility and connectivity are resolved comprehensively and such combinations of transport subsystems are selected that enable a safe, affordable, and environmentally neutral form of mobility and connectivity/accessibility between housing, jobs, and services.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing transport infrastructure affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise*.

In addition to the above descriptions and assessments, the following additional descriptions and impact assessments are given with regard to the impacts of the guidelines for developing transport infrastructure on the *exposure of people to excessive noise*: the development of corridors and entry points in the network of rail and road connections which functionally connects to the European transport network indirectly or directly affects environmental noise pollution. An increased impact on noise pollution is expected during the construction and use of infrastructure and network.

The impacts during the construction of transport infrastructure are short term, while the impacts during the operation of the infrastructure are long term. As a rule, new transport corridors mean greater impacts on the environment directly along corridors, but at the same time they have a positive effect on reducing impacts on the environment by redirecting traffic flows to existing roads the surroundings of which are usually densely populated.

The most important guidelines among the general transport infrastructure development guidelines concerning protection against noise are measures that ensure a reduction in noise emissions, such as updating the vehicle fleet (railway passenger transport and freight transport, public transport, road vehicles), the modernisation of road and railway infrastructure and measures to reduce the impact of noise on the environment. Guidelines that indirectly influence the redirection of traffic flows on long-distance transit transport corridors (to the railway network as a priority) and in the urban environment (public transport) are also important. Almost all general transport infrastructure development guidelines have a positive impact on reducing noise pollution by road and rail transport.

Impacts of the guidelines for the development of transport infrastructure on reducing the exposure of people to excessive noise are assessed as insignificant under the conditions (grade C).

General mitigating measures of the guidelines for developing transport infrastructure for achieving the goal of reducing the exposure of people to excessive noise:

Transport infrastructure corridors should be sited into the environment by:

- ensuring that transport does not cause excessive burdening of the environment through noise,
- ensuring that transport does not increase total noise pollution in an area where pollution was excessive prior to the introduction of new transport infrastructure;

- ensuring that noise protection measures are taken to prevent and reduce noise in the environment as a result of transport.

The provided general mitigation measures for attaining the goal (12) 'Reduce the exposure of people to excessive noise' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[PR18] Exposure to noise from transport:** the indicator shows noise exposure along important roads and railway lines in the *Lday* and *Lnight* periods and exposure of people to noise in agglomerations (Ljubljana and Maribor) due to the noise from road and rail transport and important industrial facilities and devices.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing energy infrastructure in support of a transition into a low-carbon society affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure of people to excessive noise*.

The impacts of the guidelines for developing energy infrastructure to support the transition to a low-carbon society on reducing the exposure of people to excessive noise are assessed as insignificant (grade B).

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for energy networks affecting the reduction and prevention of adverse effects on human health from the perspective of *excessive noise*.

Guidelines for energy networks have a positive impact on reducing the exposure of people to excessive noise (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

The guidelines refer to the long-term supply of economically significant and indigenous mineral raw materials to the state. The utilisation of indigenous mineral raw materials is intended for the provision of traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. The acquisition of economically significant mineral raw materials primarily refers to the utilisation of mineral raw materials in construction; however, due to priority use of recycled construction waste, the pressure on the opening of new sites for the utilisation of mineral raw materials in construction is expected to be reduced.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for protecting and supplying mineral raw materials affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise*.

Guidelines for protecting and supplying mineral raw materials do not have an impact or have a positive impact on reducing the exposure of people to excessive noise (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for rural development, agriculture, forestry, and fisheries affecting the reduction and prevention of adverse effects on human health from the perspective of *exposure to excessive noise*.

Guidelines for rural development, agriculture, forestry and fisheries do not have an impact or have a positive impact on reducing the exposure of people to excessive noise (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on reducing the exposure of people to excessive noise (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *Guidelines for tourism development have a positive impact on reducing the exposure of people to excessive noise (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *Guidelines for defence activities have a positive impact on reducing the exposure of people to excessive noise (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters do not have a direct impact on reducing the exposure of people to excessive noise (grade A).*

Environmental objective 13: Prevent adverse effects on human health from the perspective of EMR and light pollution

Set 1 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The guidelines for planning and developing settlements address the reduction and prevention of adverse effects on human health from the perspective of environmental burden due to EMR and light pollution with the following guidelines for planning and developing settlements:

- the quality of life in settlements is raised by: improving the *access to services of general interest and general economic significance*, access to housing and jobs through sustainable mobility methods and by reducing mobility needs (improving the possibility of working from home); by reducing living costs in towns and cities, particularly through *energy efficient construction and cascading use of energy* at the level of buildings or settlements; by improving the possibilities for at least a 5-minute accessibility on foot to green areas and outdoor recreation; by *reducing noise levels in settlements*, e.g. by encouraging the use of less noisy means of transportation; by reducing or adjusting *night lighting*, particularly along roads and in the immediate vicinity of dwellings, hospitals, social institutions, especially in areas with landscape recognisability, in broader protected areas and cultural heritage areas; by *improving air quality in settlements, reducing emissions from combustion plants and means of transportation*, and by improving the structure, type, and size of green areas and their maintenance as factors that *buffer emissions and improve air quality*.

Impact on preventing adverse effects on human health from the perspective of EMR burden

The question of how harmful electromagnetic radiation (EMR) is for human health is the subject of studies and public discussions. The European Commission regularly reviews scientific studies in order to ensure that European legislation and recommendations provide a high level of protection and health safety for citizens. The EU strategy is based on the recommended EMR limit values with a safety factor of 50. In other words, the radiation limit values are set forth at one fiftieth of the lowest values at which experiments have shown harmful effects. In order to implement this strategy, the European Commission issues recommendations to member states regarding a coordinated set of precautionary measures, it regularly reviews them, and amends them, if necessary, once new scientific findings are published. Scientific experiments show that exposure to EMR at levels present in the environment or in people's homes that remain under the recommended limits is not considered to be harmful for human health.

Impacts due to low-frequency EMR: low-frequency EMR (frequencies lower than 100 kHz) is the result of alternating current and voltage used in the production, transmission, and consumption of electrical energy.

Low-frequency electrical fields are particularly powerful near high-voltage transmission lines, while magnetic fields are powerful near household appliances, induction cooktops, and welding devices. In areas accessible to people, the exposure to low-frequency fields are quite lower than limit values. If people walk directly under a high-voltage transmission line, the level of exposure to these fields is relatively high, but still within recommended values. Low-voltage transmission lines cause a significantly lower exposure level, while underground cable conduits barely cause any exposure. In households, the most powerful fields occur near household appliances, such as shavers or vacuum cleaners.

Devices for transmission, distribution, and wiring in homes as well as electrical devices are sources of low-frequency magnetic fields in our environment. In buildings near transmission lines, the value is about 0.2 μT . In addition to transmission lines and household appliances, electrical power plants and transformers, welding devices, medical devices, induction cooktops, and railway transport systems are also significant sources of low-frequency magnetic fields.

Levels of exposure to low-frequency EMR in areas accessible to people are much lower than the limit values set forth by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and lower than the stricter limit values set forth in the Decree on Electromagnetic Radiation in the Natural and Living Environment. Measurements have confirmed that a person dwelling in a building that is located away from transmission lines and transformers in accordance to regulations is not, on average, excessively exposed to low-frequency EMR, although they are occasionally irradiated due to the operation of the most powerful sources of magnetic fields in their vicinity, such as engines, heaters, or transformers in household appliances⁸³.

With regard to the guidelines for planning and developing settlements, it can be expected that measures for improving the access of people to services of general interest and services of general economic importance also mean that the access of people to electricity is improved – in other words: the result of these guidelines is a denser electric power distribution network. If prescribed conditions for sources of low-frequency EMR are taken into account and if transmission lines are consistently replaced with underground cable conduits in areas of settlements, increased exposure of people to low-frequency EMR is not to be expected.

Impacts due to high-frequency EMR: limit values for the exposure of people to high-frequency radiation defined in the Decree on Electromagnetic Radiation in the Natural and Living Environment (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 70/96) take into consideration, by applying the principle of precaution, those permitted EMR levels that are defined by the ICNIRP⁸⁴ and that were confirmed by the European Union in 1999 in the Recommendation on the Limitation of the Exposure of the General Public to Electromagnetic Fields (0 Hz to 300 GHz) (EU, 1999).

⁸³ Institute for Non-Ionizing Radiation, Personal Exposure to Low-Frequency Electromagnetic Radiation in Slovenia (Osebná izpostavljenost nizkofrekvenčnim elektromagnetnim sevanjem v Sloveniji), Ljubljana, 2010.

⁸⁴ ICNIRP is the International Commission on Non-Ionizing Radiation Protection that issued guidelines for EMR exposure for frequencies up to 300 GHz in 1999 and amendments to the guidelines for frequencies from 1 Hz to 100 kHz in 2010.

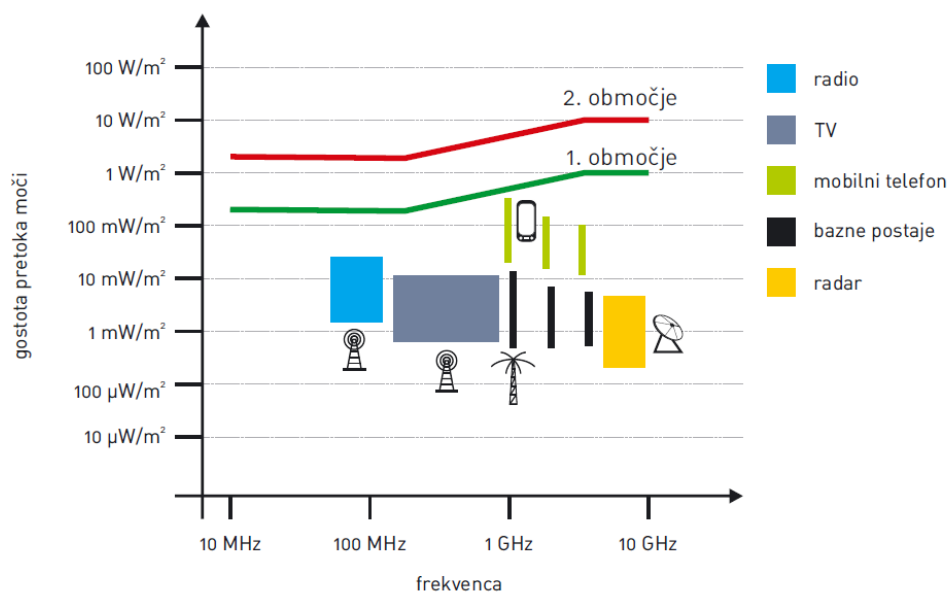


Figure 43: Irradiance due to EMR from high-frequency sources.

Slo	Ang
Gostota pretoka moči	Flux density
Frekvenca	Frequency
Mobilni telefon	Mobile phone
Bazne postaje	Base stations

Contrary to ICNIRP guidelines, Slovenian regulations separately set forth limit values for what is known as the ‘EMR protection area I’ and separately for ‘EMR protection area II’. For EMR protection area I, which includes sensitive areas, such as schools, kindergartens, hospitals, residential areas, and similar, the prescribed limit values are 10-times stricter than the ICNIRP limit values which already include the safety factor of 50 for people. This means that there is a safety factor of 500 for protection area I.

For EMR protection area II (these are areas without dwellings intended for industrial, craft, or other, similar production activities, areas intended for public road or rail transport, other natural areas), the applicable limit values are similar to the ones set forth by ICNIRP guidelines. The figure below shows a comparison of irradiance due to various high-frequency sources in the environment depending on the limit values for high-frequency EMR protection areas I and II set forth in regulations⁸⁵.

It is evident from the comparison of irradiance values that, if high-frequency EMR sources are used normally and if the prescribed limits are taken into consideration, people cannot be, on average, excessively exposed to high-frequency EMR. The use of the precautionary principle when determining excessive exposure to high-frequency EMR ensures such permissible values of exposure of people that are not, on the basis of current knowledge, harmful to human health.

When planning and developing settlements, the following recommendations apply with regard to siting EMR sources⁸⁶: when planning electrical lines and base stations:

⁸⁵ Digital Railway Radio Network GSM-R (Digitalno železniško radijsko omrežje GSM-R), issued by: Ministry of Infrastructure and Spatial Planning, Institute for Non-Ionizing Radiation (INIS), Slovenian Radiation Protection Administration, text by: doc. dr. Peter Gajšek, dr. Blaž Valič, and doc. dr. Damijan Škrk, Ljubljana, September 2014.

- urban planning measures for siting high-voltage transmission lines and other electrical installations should be sited at a safe distance from dwellings;
- strict safety standards for the impact of electrical systems on human health when siting and constructing new dwellings should be used;
- limit values for relay antennas pursuant to the precautionary principle should be reduced⁸⁷ and systems for comprehensive and constant monitoring of all antennas should be installed;
- the location of all new antennas for telecommunication networks (GSM, UMTS, WiFi, or WIMAX) should be determined, not only considering the interests of operators, but also after consulting with local and regional authorities, locals, and associations of relevant citizens.

Taking into consideration the above recommendations of the Parliamentary Assembly of the Council of Europe, the guidelines for planning and developing settlements are considered to be suitable for preventing adverse effects on human health from the perspective of irradiation through low-frequency and high-frequency EMR.

Impact on preventing adverse effects on human health from the perspective of light pollution

Light pollution of the environment is mainly caused due to the following reasons⁸⁸:

- the mass use of shadeless lighting fixtures. Although the use of exterior lighting fixtures is defined by the Decree on Limit Values Due to Light Pollution of the Environment (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 81/07, 109/07, 62/10, and 46/13) and shaded lighting fixtures are available in the market, the proportion of technologically obsolete and shadeless lighting fixture is still large in Slovenia. Such lighting fixtures emit much of their light directly into the sky. Shaded lighting fixtures concentrate light only to the areas where lighting is required;
- excessive use of lighting. The problem is not in the excessive number of lighting fixtures, but in the light intensity. Excessive use is mainly present when lighting public areas and roads and some cultural monuments;
- the use of poor lighting that pollutes the environment and is the result of the lack of knowledge and people with knowledge in the field. In major Slovenian towns and cities, only some companies and individuals are professionally active in the field. Municipalities should invest in companies that deal with lighting in order to improve quality and reduce environmental damage;
- the absence of environmental protection measures is evident (measures taken by inspection and administrative control) in the field of exterior lighting, despite the regulation that governs this field, both with regard to the use of shadeless lighting fixtures as well as with regard to the excessive use of exterior lighting.

Light pollution is light that has a disruptive effect in the environment and appears as airglow, glare, or lighting outside of areas that should be illuminated. The excessive use of electric energy is directly connected to disruptive light due to ineffective lighting fixtures and their unsuitable siting. People are most exposed to disruptive light when such light enters their dwellings. The unnecessary illumination of living spaces at night may cause sleeping issues and concentration issues. Light pollution has a harmful effect on human health.

When introducing artificial lighting fixtures, questions arose whether blue light, which dominates artificial light, has a harmful effect on human health. It is evident from the below opinion of the Scientific Committee of the Commission⁸⁹ that there is no such harmful effect:

⁸⁶ According to Resolution 1815 of the Parliamentary Assembly of the Council of Europe, May 2011.

⁸⁷ 'ALARA' principle

⁸⁸ Partially summarised according to <https://svetlobnoonesnazevanje.wordpress.com/>.

⁸⁹ European Commission; Health Effects of Artificial Light: http://ec.europa.eu/health/scientific_committees/opinions_layman/artificial-light/en/index.htm.

“Visible and IR radiations from artificial lights are unlikely to have any effects on health, unless they are extremely intense and used at close range. Overexposure to UV causes burns in the short term and, over long periods of time, contributes to the risk of developing skin cancer (melanoma) as well as squamous cell carcinoma (SCC) and basal cell carcinoma, (BCC). According to a worst case scenario the highest measured UV emissions from lamps used in offices and schools, but not the very low emissions lamps used for household lighting, could add to the number of SCCs in the EU population. There is no evidence that short-term exposure to lamps used normally in offices or at home would cause any damage to the eye. The blue component of visible light can harm the retina but this is only caused by accidental exposure to sunlight or to very high intensity artificial lights so is rare. There is no consistent evidence that long-term exposure to blue light at lower intensity causes any damage to the retina.”

However, light pollution has a harmful effect on health if it impacts the wakefulness of people or disrupts their sleep. The Scientific Committee of the Commission clarifies this harmful effect in the following manner:

“Life on Earth has evolved around a 24-hour day with roughly 12 hours of daylight followed by 12 hours of dark; and many biological processes follow this circadian rhythm. In mammals, this 24-hour “clock” is controlled by the hypothalamus but is also affected by external factors, mainly light. Specific photoreceptors in the retina receive information on light and send the signal directly to the hypothalamus and to other parts of the body that influence sleep, mood and memory. The production of melatonin, a powerful hormone, is also ruled by the circadian rhythm so that it is synthesized almost exclusively at night. This hormone sends signals to the rest of the body to tell whether it is day or night and promotes sleep. Melatonin also has other important roles as an antioxidant and a protective agent against “wear and tear” in tissues. Exposure to light in late evening, at night or early morning disrupts the circadian rhythm and the production of melatonin, and hence has an effect on sleep, mood and cognition. Severe disruption of circadian rhythms is linked to breast cancer and could also play an important role in the development of breast, prostate, endometrial, ovary, colorectal and skin cancers; cardiovascular diseases, reproduction, endometriosis, gastrointestinal and digestive problems, diabetes, obesity, depression and sleep deprivation.”

Taking into consideration the limitations and conditions of exterior lighting arising from the Decree on Limit Values Due to Light Pollution of the Environment (Official Gazette of the Republic of Slovenia [Uradni list RS], Nos. 81/07, 109/07, 62/10, and 46/13), the guidelines for the planning and development of settlements could be considered as suitable related to preventing adverse effects on human health from the perspective of light pollution if:

- said Decree fully took into account the features of the state of the art in the field of exterior lighting, and
- the prescribed monitoring of the annual consumption of electricity through all lighting fixtures installed as public lighting in settlements, calculated per capita for each settlement, would be modernised by separately evaluating electricity consumption for LED lights and separately for electricity consumption for gas discharge lamps,
- more effective supervision of light pollution would be introduced.

Because guidelines for planning and developing settlements do not address issues related to current excessive light pollution and because current light pollution legislation does not follow the current state of the art and fails to ensure an effective supervision of measures for preventing impacts of light pollution on human health, *the impact of the guidelines for planning and developing settlements on preventing the adverse effects on human health from the perspective of exposure to light pollution is insignificant under the conditions (grade C).*

- urban settlements are the most significant building block in urban development. They are being developed into a vibrant, cohesive, and well-developed environment providing conditions for economic and social development and contributing to the *quality of life of the entire population*. They are being developed according to the principle of multi-functionality, and the principle of complementarity is used to promote the mixed use of space. In order to develop an efficient town or city, a suitable ratio between the use of land and buildings is provided, and efforts are made to ensure a mix of various functions and activities.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for urban development affecting the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

Guidelines for urban development have a positive effect (grade A) on preventing adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution.

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The guidelines for rural development address the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution* with the following guidelines for rural development:

- access of people to basic services of general interest is ensured through a suitable and sufficient level of supply in centres and other settlements that are significant for the development of the region and are determined in the regional spatial development plan;
- major agricultural facilities that are considered to be facilities affecting the environment due to *noise* or stench are sited or relocated to areas with manufacturing activities or areas outside of compact settlements on the basis of a comprehensive spatial-development and environmental assessment. For agricultural production in which the production method is not directly related to agricultural land (e.g. greenhouses), degraded brownfield areas in settlements, particularly near roads, which are not suitable for building dwellings or business premises, or environmentally degraded areas, provided that they do not pose a health risk for carrying out such activities, are to be used as a priority.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for rural development affecting the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

Guidelines for rural development have a positive effect (grade A) on preventing adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution.

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The guidelines for green infrastructure at a regional and local level do not directly address the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The guidelines for green infrastructure at a regional and local level do not affect the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and the coast

The guidelines for developing the sea and the coast address the reduction and prevention of adverse effects on human health from the perspective of *environmental burden due to EMR and light pollution* through the following guidelines from the group of guidelines for developing the sea and the coast:

- the development strategies of the coast or tourism in the coastal area, which are a part of regional or local development and spatial planning documents, must, as a priority, include activities related to adapting to climate change, particularly in the development and planning of settlements and green infrastructure, port activities, and activities for managing natural resources. Solutions must use an integral method to address the adaptation of settlement areas to sea level rise, more droughts, *lack of drinking water and water for business*, heat islands and seasonal pressures due to tourism, including relieving pressure on municipal utility services.

1.5.2 Guidelines for tourist areas

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

1.5.4 Guidelines for nature protection areas and cultural heritage areas

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guidelines for tourist areas, the guidelines for preserving and improving the recognisability of settlements and the landscape, the guidelines for nature protection areas and cultural heritage areas, and the guidelines for providing spatial capacities for a low-carbon society do not directly address the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts from all of the sub-groups from the *guidelines for special areas and applications* affecting the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The comprehensive assessment of the impacts of the guidelines for special areas and applications on preventing adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution: the guidelines for special areas and application have a positive effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The guidelines for developing transport infrastructure directly address the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*. The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing transport infrastructure affecting the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The guidelines for developing transport infrastructure have a positive effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for developing energy infrastructure in support of a transition into a low-carbon society affecting the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

Guidelines for developing energy infrastructure in support of a transition into a low-carbon society have a positive impact on preventing adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels. The guideline for energy network foresees the partial extension of the transmission network and mainly the renovation and extension of the distribution network for the purpose of introducing the concept of what is known as a smart electricity grid. The enhancement and upgrade of the distribution network with 110, 200, and 400 kV transmission lines is foreseen, whereby existing transmission lines with already defined protected corridors are foreseen for this enhancement and upgrade, so the area under the high-voltage transmission lines and their area of influence will not change significantly. The descriptions and impact assessments stated in point 1.1 of this chapter for the guidelines for planning and developing settlements apply to the descriptions and assessments of impacts of the guidelines for energy networks affecting the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The impacts of the guidelines for energy networks on preventing adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution are assessed as insignificant (grade B).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

The guidelines that refer to the long-term supply of the country with economically significant and indigenous mineral raw materials do not directly impact the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The guidelines for protecting and supplying mineral raw materials do not have an effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines that refer to the protection and sustainable use of the production potential of agricultural land and the planning of measures for improving farming conditions and adapting to climate change do not directly impact the reduction and prevention of adverse effects on human health from the perspective of the *environmental burden due to EMR and light pollution*.

The guidelines for rural development, agriculture, forestry, and fisheries do not have an effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *The guidelines for nature conservation do not have an effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *The guidelines for tourism development do not have an effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *The guidelines for defence activities do not have an effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *The guidelines for the preventive protection against natural and other disasters do not have a direct effect on the prevention of adverse effects on human health from the perspective of the environmental burden due to EMR and light pollution (grade A).*

7.2.7 POPULATION AND MATERIAL ASSETS

Environmental objective 14: Ensure optimum distribution of activities in space

Pursuant to the Green Paper on Territorial Cohesion⁹⁰, territorial cohesion is about ensuring the harmonious development of diverse places within EU territory and about making sure that their citizens are able to make the most of inherent features of these territories. As such, territorial cohesion is a means of transforming diversity into an asset that contributes to sustainable development of the entire European Union.

The **territorial cohesion** concept, also known as the concept of **providing optimum spatial distribution of activities and services**, builds bridges between *economic efficiency, social cohesion, and ecological balance*, thus placing sustainable development at the forefront of policy-making.

Territorial cohesion is the essence of European Union's structural policies⁹¹. Even some sectoral policies, including environmental legislative instruments, have a built-in territorial impact, while some have available instruments for overcoming special territorial issues⁹².

More balanced and sustainable development, implicit in the notion of territorial cohesion, would achieve a more even and sustainable use of assets, including natural sources, such as drinking water, renewable energy sources, areas with rich biodiversity, etc., bringing economic gains from less congestion and reduced pressure on costs, with benefits for both the environment and the quality of life.

The noticeable feature of European and also Slovenian economic activities is that they are concentrated in certain areas. Such concentration of economic activities brings benefits, such as:

- gains from such concentration and from the clustering of particular activities in specific locations,
- the wide availability of health care services, and
- the relatively easy access to higher education institutions and training facilities.

The concentration of economic activity is reflected in the high level of GDP per head, productivity, employment and research and innovation activity relative to the national average in capital cities and in most other densely populated conurbations.

At the same time, there are also diseconomies from congestion and a number of inner city areas face acute problems of urban decay and social exclusion, although this is now yet as pronounced in Slovenia.

Small cities and towns can also benefit from increasing returns if they create a strong network of cities and towns and develop their strengths in a coordinated manner. Towns and cities in mostly rural regions, such as Slovenia, also provide essential services for the surrounding rural areas.

Indeed, in rural areas which are more remote from cities of any size, small and medium-sized towns often play a more important role than their size might suggest. The role these towns play in providing access to services including the infrastructure necessary to invest in the adaptability of people and

⁹⁰ COM(2008) 616 final, Commission Communication: Green Paper on Territorial Cohesion.

⁹¹ The term 'European Union's structural policies' mainly refers to the political measures of the ERDF, ESF, the Cohesion Fund, and the European Agricultural Fund for Rural Development and the European Fisheries Fund.

⁹² E.g.: territorial issues related to discharging urban (municipal) waste water or the handling of municipal waste in remote areas (islands or remote mountain areas).

enterprises, is key to avoiding rural depopulation and ensuring these areas remain attractive places to live.

Although most economic activity is concentrated in towns and cities in the European Union, rural areas remain its essential part for implementing sustainable development measures. They are the location of most of the natural resources and natural areas (lakes, forests Natura 2000 sites, etc.), have good air quality, and are often attractive and safe places to live.

The situation in Slovenia is similar: economic activities are concentrated in Slovenia's central region and in its coastal areas, while rural areas (including small cities and towns) are the essential part of Slovenia for implementing its sustainable development measures.

The key challenge is to ensure a balanced and sustainable territorial development of the country as whole, strengthening its economic competitiveness and capacity for growth while respecting the need to preserve its natural assets and ensuring social cohesion. This implies avoiding excessive concentrations of economic activities and facilitating the equal access to the returns from increased economic activities in all of Slovenia's territory.

Environmental objective 14 "Ensure optimum distribution of activities in space" is fully compliant with the SDSS 2050 strategic goals (rational and effective spatial development, competitiveness and attractiveness of Slovenian towns and cities, high-quality life in urban and rural areas, enhancing spatial identity and multifunctionality of space, resistance of space and adaptability to change).

All guidelines for achieving the SDSS 2050 goals have a positive effect on ensuring optimum spatial of activities and services in space (grade A).

Indicators for status monitoring:

- **[SE03] Human development index:** The indicator shows the Human Development Index (HDI), which is an important indicator of the complexity of the relationship between income and well-being as well as the interwovenness and interconnectedness of economic and social policies. The HDI presents welfare in three areas of social development. It is composed of indicators that reflect achievements in three dimensions of human development – health (life expectancy at birth is used to assess length of life and health conditions), income or access to resources that enable people to achieve a decent standard of living (GDP per capita at purchasing power parity) and education level or knowledge attained (gross inclusion and literacy rate that indicate the combined rate of enrolment at various levels of education or literacy rate of the adult population).

-**[TU01] Development and distribution of tourism:** The indicator shows the number of available beds and of overnight stays in the 1992–2009 period.

-**[SE01] Gross domestic product:** The indicator shows the gross domestic product per capita according to purchasing power in Slovenia.

Environmental objective 15: Ensure good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk

Set 1 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

Mainly the following guideline from the group of guidelines for planning and developing settlements has a direct effect on maintaining a low flood risk or reducing flood risk:

- pursuant to the law, areas for long-term development are planned in areas where good access through public transport and other forms of public transport can be organised, whereby existing options, particularly the railway, are to be used as a priority. More suitable areas for being defined as areas for long-term development also include areas with greater sunlight exposure, which increases the possibility for a passive or active energy supply using renewable energy sources (surplus heat and potential for the use of solar energy), taking into consideration the restrictions arising from protection regimes. Areas for long-term development may not increase the vulnerability of space in the general area of a settlement, i.e. they may not *worsen flood risk or intervene with natural floodplains* or other areas with potential natural disasters that arise from current or potential risk, taking into consideration the expected consequences of climate change.

The impact of the guidelines for planning and developing settlements on ensuring the maintenance of low flood risk or reducing flood risk: in accordance with Directive 2007/60/EU, risk due to all types of floods is managed in a coordinated manner in a three-level process, whereby member states:

- carried out preliminary flood risk assessments for their river basins and related coastal areas by 2011 in order to define the areas with potential flood risk,
- drafted flood hazard maps and flood risk maps by 2013 for areas with real risk of flood damage. For areas that have been found to be at risk, the number of people potentially at risk, economic activities, and environmental damage potential are listed,
- drafted flood risk management plans for these areas by 2015. These plans include measures to reduce the likelihood of floods and their potential consequences.

The measures according to Directive 2007/60/EU focus on:

- preventing damage caused by floods by avoiding the construction of houses and industries in existing and new floodplains or by adapting the future development of settlements to flood risk,
- reducing the likelihood of floods and/or the impact of floods at a particular location, such as the restoration of floodplains and wetlands, and
- being prepared for floods, e.g. by providing instructions to the public on what to do in the event of a flood.

Flood risk management plans must be reviewed every six years, coordinated with the cycle of implementing the Water Framework Directive (WFD). Member states will draft updated flood hazard maps and flood risk maps by the end of 2019.

On the basis of the preliminary flood risk assessment for the area of Slovenia⁹³ and the Report on Determining Areas of Important Impacts of Floods in the Republic of Slovenia⁹⁴, 61 areas of

⁹³ Preliminary Flood Risk Assessment for the Republic of Slovenia, December 2011.

⁹⁴ Report on Determining Areas of Important Impacts of Floods in the Republic of Slovenia, 2013.

important impacts of floods covering a total of 47 km² and home to approximately 130,000 people, with about 23,000 buildings, approximately 1500 cultural heritage units, and 17,000 economic operators have been defined for the area of Slovenia.

Flood hazard maps have also been drafted for the areas of important impacts, specifically for the following three flood event scenarios:

- low-probability scenario, i.e. 500-year floods,
- medium-probability scenario, i.e. 100-year floods,
- large-probability scenario, i.e. 10-year floods.

According to the Institute for Water of the Republic of Slovenia, approximately 7% of Slovenia's population lived in flood areas in 2012. The most extensive floodplains are the flat plains in northeastern and sub-Pannonian Slovenia, in pre-Alpine valleys and basins, and the lowlands along the rivers Ledava, Mura, and Ščavnica. The largest proportion of people living in floodplains is in the Savinja region (13%), in Koroška (12%), Zasavje (10%), and the Central Slovenian (9%) statistical region⁹⁵.

Pursuant to the Flood Risk Reduction Plan 2017–2021⁹⁶, twenty types of measures (flood protection measures), which are included in the five steps of the flood risk management cycle, have been classified in the Slovenian catalogue of flood protection measures:

- 'prevention' – activities for reducing flood risk and promoting suitable land use, agricultural land management, and forest management,
- 'protection' – activities for reducing the likelihood of floods, reducing the impact of floods at a particular location, and increasing the resistance to floods,
- 'awareness' – providing people with information on flood risks and on suitable measures to be taken in the event of a flood,
- 'preparedness' – activities in the event of a flood, and
- 'restoration' – restoring the situation as it was before the flood as soon as possible, carrying out an analysis, and taking into account new findings.

Mainly the 'prevention' and 'protection' activities, which are defined in detail in the Flood Risk Reduction Plan 2017–2021, are significant for the guidelines for achieving the SDSS 2050 goals and carrying out the spatial development concept in each of the 61 areas of important impact of floods. These activities must be consistently taken into account when planning and developing settlements.

The part of the guidelines for developing settlements that deals with flood risk has a positive effect on maintaining a low flood risk or reducing flood risk (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The guidelines for urban development do not directly address flood risk and do not have a negative impact on maintaining a low flood risk or reducing flood risk.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of guidelines for planning and developing settlements on flood risk apply to the descriptions and impact assessments of guidelines for urban development on maintaining a low flood risk or reducing flood risk.

⁹⁵ <http://kazalci.arso.gov.si/sl/content/delez-prebivalcev-ki-zivijo-na-poplavno-ogrozenih-obmocjih>

⁹⁶ Flood Risk Reduction Plan 2017–2021 (NZPO SI), July 2017.

The guidelines for urban development have a positive effect on maintaining a low flood risk or reducing flood risk (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The guidelines for rural development address flood risk with the following guideline:

- planning settlements and road infrastructure is adapted to the characteristics of settlements and villages by maintaining the recognisability of settlements and the landscape. In order to decrease social costs and potential human victims, settlements are moving from the areas at risk in the long term (*from areas in the class of large or medium flood risk, areas with the risk of avalanches and landslides*).
- with regard to bridging water areas, such plans and solutions are provided that do not exacerbate flood risk,
- water infrastructure is installed so that the area of influence next to potential demolition sites do not pose a major threat to humans or their material assets.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of guidelines for planning and developing settlements on flood risk apply to the descriptions and impact assessments of guidelines for rural development on maintaining a low flood risk or reducing flood risk.

The guidelines for rural development have a positive effect on maintaining a low flood risk or reducing flood risk (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The green system of a region is used to ensure the multifunctionality of space at a regional level, particularly the ecological and environmental function and the use of space compatible with these functions, the maintenance and improvement of the positive state of habitats in the Natura 2000 areas, the adaptation to climate change, particularly through maintaining areas for floodplains, the restoration of natural ecosystems, particularly the soil and forests, and the recognisability of the landscape and recreation in open space.

Forest, agricultural, or water land and other open spaces (e.g. endangered or protected areas, such as floodplains, *water protection areas*, protected areas) that can contribute to carrying out the multifunctional role of a green system can be included into the green system of a region.

The descriptions and impact assessments stated in point 1.1 of this chapter for the impacts of guidelines for planning and developing settlements on flood risk apply to the descriptions and impact assessments of guidelines for green infrastructure at a regional level on maintaining a low flood risk or reducing flood risk.

In its communication, the European Commission⁹⁷ stresses that green infrastructure solutions boost disaster resilience and are also an integral part of EU policy on disaster risk management. Climate change and infrastructure development make disaster-prone areas more vulnerable to extreme weather events and natural disasters, such as floods, landslides, avalanches, forest fires, storms and wave surges.

⁹⁷ COM(2013) 249 final, Commission Communication: Green Infrastructure (GI) — Enhancing Europe's Natural Capital.

Green infrastructure can also help reduce vulnerability to risks by supporting local livelihoods and economies. Investments in green infrastructure and ecosystem-based disaster risk reduction can thus provide many benefits for innovative risk management approaches, adapting to climate change-related risks, maintaining sustainable livelihoods and fostering green growth. Towns, cities, and local communities are the first ones to combat the direct results of such disasters and play a key role in implementing preventive measures, such as green infrastructure.

The guidelines for green infrastructure at regional and local levels have a positive impact on maintaining a low flood risk or reducing flood risk (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and the coast

1.5.2 Guidelines for tourist areas

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

1.5.4 Guidelines for nature protection areas and cultural heritage areas

The Guidelines for developing the sea and the coast, the guidelines for tourist areas, the guidelines for preserving and improving the recognisability of settlements and the landscape, and the guidelines for nature protection areas and cultural heritage areas do not address flood risk and do not have a direct impact on maintaining a low flood risk or reducing flood risk.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guidelines for providing spatial capacities for a low-carbon society have a positive impact on flood risk.

Comprehensive assessment of impacts of the guidelines for special areas and applications on flood risk: guidelines for special areas and applications do not have an impact on maintaining a low flood risk or reducing flood risk, or their impact is positive (grade A).

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The guidelines for developing transport infrastructure do not address maintaining a low flood risk or reducing flood risk (grade A).

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The guidelines for developing energy infrastructure to support a transition into a low-carbon society address flood risk by way of the following guideline:

- before planning new energy facilities using renewable energy sources, the options provided by existing energy facilities are used as a priority for an update by way of more modern technology for obtaining or using the additional potential of renewable energy sources and

improving energy efficiency and reducing the impact of such facilities on the environment. In doing so, *flood safety*, ecological connectivity, supplying underground aquifers, and people's health are ensured to the best possible extent.

The impacts of developing energy infrastructure on maintaining a low flood risk or reducing flood risk: with regard to new energy facilities using renewable energy sources, the planned new hydroelectric power plants with a rated capacity exceeding 10 MW are significant for flood risk. These hydroelectric power plants are mostly located in areas determined as areas with an important flood impact pursuant to the criteria and on the basis of the data arising from the Preliminary Flood Risk Assessment. Flood hazard maps have already been drafted for the areas of influence of the planned new hydroelectric power plants, while flood risk maps are also being drafted, in which the sources and levels of flood risk are defined in detail and the damage that may be incurred in the event of extreme flood events is recorded. It is justifiably expected from the water regimes in the area of these new hydroelectric power plants to reduce the existing flood risk at least to the same extent as the existing flood risk in the areas of influence of the recently built hydroelectric power plants on the lower River Sava has been reduced. The construction measures that will be implemented in the area of influence of the new hydroelectric power plant in order to stabilise the flow regime will also significantly and permanently reduce the flood risk in the area. On the other hand, the flood risk in the area of influence of the hydroelectric power plant will increase due to the building of a hydroelectric power plant dam in the water environment because:

- there is a risk of floods because of improper operations, such as an event with simultaneous emptying of the reservoir and the occurrence of a flood wave in the watercourse, and
- a risk of a flood due to the demolition of a dam.

The risk of a flood due to the demolition of a hydroelectric power plant dam is small, but cannot be excluded; however, the flood risk due to the improper of operation of a hydroelectric power plant should be paid more attention, particularly because the current 100-year floods are now more frequent due to the more common extreme weather events (shortening of return periods of extreme precipitation).

The impacts of developing energy infrastructure on maintaining a low flood risk or reducing flood risk are assessed as insignificant under the conditions (grade C).

General mitigating measures of the guidelines for developing energy infrastructure for achieving the goal 'Ensuring the preservation of a low flood risk or reducing flood risk':

When siting hydroelectric power plant dams into aquatic environments, it must be ensured that flood risk in the area of influence of a hydroelectric power plant does not increase due to:

- a risk of floods due to improper operations, such as an event with simultaneous emptying of the reservoir and the occurrence of a flood wave in the watercourse, and
- a risk of a flood due to the demolition of a dam.

The provided general mitigation measures for attaining the goal (15) 'Ensure the preservation of a low flood risk or reduce flood risk' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **[ZD24] proportion of resident population living in a flood plain:** The indicator shows the proportion of people living in flood plains.

2.3 GUIDELINES FOR ENERGY NETWORKS

The guidelines refer to the restoration and the upgrading of the transmission and distribution electricity grid, and the modernisation and the upgrading of the transmission gas network and the expansion of the distribution gas network in view of the needs at regional and local levels.

The guidelines for energy networks do not have an effect on maintaining a low flood risk or reducing flood risk (grade A).

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

The guidelines for protecting and supplying mineral raw materials do not have an effect on maintaining a low flood risk or reducing flood risk (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The guidelines refer to the protection and sustainable use of the production potential of agricultural land, and the planning of measures to improve agricultural conditions and the adaptation to climate change, while taking into account the natural conditions and features, and the conditions to provide ecological connectivity, preserve biodiversity and natural valuable features, cultural heritage and recognisable landscape features.

The guidelines for rural development, agriculture, forestry and fisheries do not have an effect on maintaining a low flood risk or reducing flood risk (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

The SDSS 2050 guidelines for nature conservation refer to the preservation of habitats of species, particularly by protecting ecosystems and natural habitats, preserving landscape features, and protecting natural valuable features. Protected areas are a key instrument in nature conservation. To attain nature conservation objectives, nature conservation is connected, harmonised and shaped to develop common synergies with other fields of land development, particularly agriculture and forestry, water protection and management, and cultural heritage protection, tourism and rural development, particularly within protected areas. *Guidelines for nature conservation do not have a direct impact on maintaining a low flood risk or reducing flood risk (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *The guidelines for tourism development do not have an effect on maintaining a low flood risk or reducing flood risk (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *The guidelines for defence activities do not have a direct effect on the prevention of adverse effects on maintaining a low flood risk or reducing flood risk (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters have a positive impact on the preventing adverse effects on maintaining a low flood risk or reducing flood risk (grade A).*

7.2.8 CULTURAL HERITAGE

Environmental objective 16: Ensure comprehensive cultural heritage preservation

Set 1 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The guidelines which have an impact on ensuring comprehensive cultural heritage conservation:

- new urban planning, landscape architectural, and architectural settlement planning must contribute to preserving regional and local spatial identity and the recognisability of settlements and the landscape;
- planning settlements is carried out as a priority through renovation and internal development, taking into consideration the guidelines concerning the protection of cultural heritage and the environment and concerning the recognisability of settlements and the landscape, and through including cultural heritage into renovation;
- the planning of rural settlements is carried out as a priority through the renovation and internal development of settlements, together with the renovation of mobility, supply with energy and other sources, taking into consideration the preservation level of high-quality centres of settlements and recognisable silhouettes in terms of the protection of cultural heritage and the environment and the recognisability of settlements and the landscape;
- the determination of areas for long-term development in towns, cities, and other urban settlements, when it is not possible to meet the growing demand for dwellings and accompanying services through renovating degraded (brownfield) areas or concentrating the settlement.

By developing settlements, the pressure on cultural heritage units increases, and activities affecting these units and the areas of influence of cultural heritage during the construction of new buildings or infrastructure and during their operation are possible. The impacts of these activities are reflected in:

- degrading landscape features of the surroundings of units of cultural heritage (indirect, irreversible impact);
- damaging cultural heritage facilities (direct, reversible impact);
- destroying archaeological remains during construction (direct, local, irreversible impact).

The SDSS foresees the priority planning of settlements through renovation and internal development, whereby the energy-saving renovation of buildings also plays a significant role in renovating heritage. The planning and renovation of settlements will be carried out taking into account the vulnerability of heritage and the requirements regarding the protection of cultural heritage and the environment, preserving the regional and local identity of space, and the recognisability of settlements and the landscape, so no major pressure on cultural heritage units is expected. The definition of areas for long-term development may have an impact on areas next to the settlements where cultural heritage units are located. The development of settlements in these areas could lead to the deterioration of the landscape status of the areas surrounding cultural heritage units and the destruction of archaeological remains during the construction of the necessary infrastructure. The concern for preserving the recognisable cultural elements of the environment, the renovation of cultural heritage, and its inclusion into the life of the community, as well as the inclusion of degraded or abandoned cultural heritage areas into concentrated social infrastructure has a positive effect.

The impact of the planning and development of settlements on ensuring comprehensive cultural heritage conservation is assessed as insignificant, while the legal regimes concerning the protection of cultural heritage are taken into account (grade A).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The guidelines for urban development do not directly address the comprehensive cultural heritage conservation, but the provision of comprehensive cultural heritage conservation is expressed indirectly through the following guidelines:

- the development of urban settlements is based on the priority renovation of existing degraded areas that have already undergone urban planning with suitable concentration of urban structure;
- the development of urban settlements is planned comprehensively with the goal of achieving synergy between spatial competitiveness, identity, and quality;
- the improvement of the attractiveness of towns and cities through sustainable renovation and the use of cultural heritage.

Urban development may affect cultural heritage units and their areas of influence through re-locating activities, social and economic infrastructure, and dwellings, particularly when siting new (infrastructural) facilities. SDSS guidelines foresee the development of urban settlements with the priority renovation of existing degraded areas that have already undergone urban development with suitable concentration of urban structure, which results in a small chance of affecting protected cultural heritage areas. When siting urban development infrastructure into space, the siting of facilities in cultural heritage areas should be avoided, taking into consideration cultural heritage protection regimes.

The impact of urban development on the environmental objective is assessed as insignificant (grade A).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The guidelines which have an impact on ensuring comprehensive cultural heritage conservation:

- ensuring access of people in mountain, remote, and border areas to services of general interest;
- developing inter-sectoral measures to support the preservation of the settlement of inland and border mountain areas;
- the priority development of agriculture, forestry, and adapted forms of tourism, which are based on the sustainable use of natural resources and *diverse cultural heritage* and do not require extensive infrastructure;
- new activities in the countryside must contribute to the greater inclusion of cultural heritage into the life of rural communities;
- paying special attention to the renovation of old urban centres (urban heritage);
- enhancing the use of renewable energy sources and providing accompanying infrastructure, taking into consideration the restrictions related to the preservation of the spatial identity and recognisability of settlements and the landscape;
- providing guidelines for and integrating agricultural and forestry activities, as a priority, with the development possibilities for protected nature and *cultural heritage* areas;
- providing direction for agriculture in protected cultural heritage areas to move into organic agriculture;
- activities affecting space, activities in the countryside, and construction activities improving the quality of the living environment are adapting to the regional and local identity, recognisability of settlements and the landscape and to the preservation of ecological connectivity;
- priority restoration of mineral resources mines which are located in areas with landscape recognisability, nature protection, or *cultural heritage* protection;

- the admissibility of exploiting rare and unique mineral raw materials in protected areas in certain locations, if such exploitation is in the form of occasional mining intended for *renovating cultural heritage*.

The siting of spatial regimes (activities affecting space) and the manner of their implementation have an impact on cultural heritage units. The performance of activities affecting space which are contrary to protection requirements and the performance of regimes or activities affecting space in cultural heritage areas pose a threat to endangering the properties and the status of cultural heritage. SDSS foresees the priority development of rural settlements through the renovation and internal development of settlements focusing on maintaining the current dwelling stock and concentrating settlement culture, which causes the pressure related to settlement spreading to cultural heritage units not to be significant. The priority restoration of mineral resources mines which are located in areas with landscape recognisability or cultural heritage will have a positive impact. The definition of locations that are admissible for exploiting rare and unique mineral raw materials, provided that this exploitation is in the form of occasional mining intended for renovating cultural heritage, is only acceptable where the occurrence of mining does not have a negative impact on landscape recognisability and protected valuable cultural heritage units.

The impact on the visible quality and significant natural structural features of the landscape is also significant due to the nature of the activity/intervention affecting space (e.g. new building and infrastructure) or the manner of implementation (additional activity). The negative impact, however, is seen in the change of land structure, the performance of hydrological improvement, the construction of infrastructure and facilities, when this is performed in cultural heritage protection areas, which endangers the properties and reduces the recognisability of cultural heritage and has an effect on access to it. The guidelines for rural development foresee the adaptation of activities affecting space, activities in the countryside, and construction activities to the regional and local identity and the recognisability of settlements and the landscape. Furthermore, such restrictions enabling the preservation of the spatial identity and recognisability of settlements and the landscape take into consideration the foreseen use of renewable energy sources and the accompanying infrastructure, which renders the impact insignificant.

Encouraging the integration of agricultural and forestry activities with the development possibilities in protected natural and cultural heritage areas has a positive impact within sustainable tourism, which is based on the sustainable use of natural resources and adds value to agricultural and forestry products. The potential renovation of the dwelling stock and other structures in the countryside and the promotion of rural development in general also has a positive impact, as this increases the possibility of renovating and preserving cultural heritage. Providing people with access to basic services and other measures to preserve settlement in more remote areas has a positive impact, as this supports maintaining the use of cultural heritage.

We assess that the impact of the guidelines for rural development on providing comprehensive cultural heritage conservation is insignificant (grade A).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

Within the planning of a green system for the region, connection with other regional green systems and the green systems of settlements is ensured, to which cultural heritage areas or units that may contribute to the multifunctional role of the green system are also added. The green systems of settlements include and, as a result, preserve the landscape elements and individual parts of open space in the area of individual settlements which are inseparably connected to its structure and function, appearance, and identity, and this has a positive impact on the visible qualities and recognisability of cultural heritage.

The guideline for green infrastructure at regional and local levels do not have an impact on providing comprehensive cultural heritage conservation or the impact is positive (grade A).

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and the coast

The guidelines which have an impact on ensuring comprehensive cultural heritage conservation:

- coastal towns and cities develop their own recognisable, attractive, and modern identity *taking into consideration tradition and heritage*;
- the performance of activities which are exclusively connected to the sea and the coast, including researching and *preserving underwater cultural heritage*;
- establishing a coastal area along the length of the entire Slovenian coast intended to, among other things, preserve cultural heritage.

The development of coastal towns and cities and the accompanying infrastructure has an impact on preserving the integrity of cultural heritage areas. By developing settlements, the pressure on cultural heritage units increases, and activities affecting these units and the areas of influence of cultural heritage during the construction of new buildings or infrastructure and during their operation are possible, as are changes of the typical appearance of the areas of influence and the cultural heritage units. When siting new (infrastructural) facilities, special attention should be paid to preserving potential archaeological remains and to prescribed legal cultural heritage protection regimes, if such regimes affect cultural heritage areas.

Through the planned development of the recognisable identity of coastal towns and cities and by taking into consideration nature, tradition, and heritage, we expect a positive impact on the basis of the concern for preserving the recognisable cultural elements, identity, and recognisability of towns and cities, by way of which the high-quality typical appearance of cultural heritage, potential renovation of cultural heritage, and its inclusion into the life of the community are ensured.

1.5.2 Guidelines for tourist areas

The guidelines which have an impact on ensuring comprehensive cultural heritage conservation:

- tourism development, either through infrastructure or visits, may not irreversibly change the sources on which tourist products are based and their quality, and must preserve the *testimonial value of cultural heritage* and the recognisability of settlements and the landscape;
- sustainable tourism development is supported; it is based on connections between nature *conservation*, the recognisability of settlements and the landscape, *cultural heritage and culture*, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility;
- the development of tourist infrastructure focuses on areas with existing tourist infrastructure and does not open new areas for tourism;
- in *cultural heritage areas*, tourist programmes and tourism development are *coordinated* with the areas's *protection goals*;
- in remote and border areas, tourism can contribute to preserving settlement and cultural heritage. There, the renovation of tourism facilities or innovative solutions for settlement are promoted, taking into consideration the conditions for *cultural heritage protection*.

Tourism in Slovenia is based on conserved nature, cultural heritage, attractive cultural landscape, mountain, coastal, and thermal areas and towns and cities. Tourism development, either through infrastructure or visits, may not irreversibly change the sources on which tourist products are based; this has a positive impact on comprehensive cultural heritage conservation. The priority long-term preservation of the testimonial value of cultural heritage, the recognisability of settlements and the landscape, and the observance/coordination of tourism development also have a positive impact. In remote and border areas, tourism can have a positive impact on cultural heritage conservation (and

settlement), which indirectly affects nature conservation, cultural landscape conservation, and forest management.

The siting of new tourist facilities and infrastructure in space or in cultural heritage areas may have a negative impact. SDSS guidelines foresee the focus of tourist infrastructure development on areas with existing tourist infrastructure, while tourist development should not introduce new areas for tourism; for this reason, the pressure due to development on cultural heritage units and their areas of influence is not increasing.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

The guidelines which have an impact on ensuring comprehensive cultural heritage conservation:

- defining recognisability elements in expert groundwork for the needs of spatial planning at a regional and local level, namely those which are preserved and those that require improvement; a special definition of recognisable landscape and settlement areas with guidelines;
- when designing settlements, spatial characteristics and inherited cultural and natural values should be observed, *historical settlements* or their parts, particularly those which are considered urban heritage, should be *preserved* through planned renovation;
- when siting spatial arrangements, distributing individual activities, land operations, or managing agricultural, forest, or water space, recognisability elements are maintained or re-established, also those in wider areas of protected nature formed by exceptional landscape, valuable natural assets, and cultural heritage, particularly *urban, architectural, and landscape heritage*.

Spatial recognisability elements are physical elements, which build more or less attractive, interesting, or rare spatial structures with great experiential value, and are particularly important for the recognisability of particular areas. The preservation and improvement/re-establishment of recognisability elements or recognisable cultural elements and the definition of recognisable landscape or settlement areas and guidelines have a positive impact. Cultural heritage units and their areas of influence are an important building block of the recognisability of settlements and the landscape, so their priority preservation during the renovation and designing of settlements has a positive impact on ensuring comprehensive cultural heritage conservation.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

- The guidelines that affect the provision of comprehensive cultural heritage conservation: in protected natural areas and in areas with immovable cultural heritage, particularly archaeological, urban, architectural, and landscape heritage, the performance of activities in protected areas and cultural heritage areas, particularly the development plans of all key sectors, must *support the achievement of nature, nature conservation protection, and cultural heritage protection objectives*, the needs of local developments, and other activities;
- within spatial development, a more active *use of heritage as a development source* and the *enhancement of the development potentials of heritage, taking into account its values* and taking into account the needs of locals, the environment, and nature, are encouraged;
- nature protection areas and *cultural heritage areas are considered added value* for regional and local development, as conserved nature and cultural heritage provide important ecosystem services and benefits, e.g. a good degree of conservation of the habitats of animal and plant species, the recovery of water sources, providing clean air, facilitating the physical and spiritual relaxation of people in a natural environment, they contribute to enhancing the recognisability of the landscape, improving the quality of the living environment, including *improving the access to cultural goods*, and offer potentials for additional development opportunities;
- the development of broader areas of nature and cultural heritage as an integral spatial category, in which the *fulfilment of nature protection objectives and cultural heritage*

protection objectives, the needs of local development, and other activities are coordinated in terms of spatial planning.

Cultural heritage areas complement the quality of the living environment and are a significant part of the area and the heritage of the Republic of Slovenia and are invaluable for the recognisability of the landscape and settlements. They are considered added value for regional and local development, as cultural heritage provides significant services and benefits and offers potentials for additional development opportunities.

The performance of activities in areas with immovable cultural heritage, particularly archaeological, urban, landscape, and architectural heritage, has a positive impact, while cultural heritage protection objectives are fulfilled at the same time. The development of broader areas of cultural heritage as an integral spatial category, in which the fulfilment of cultural heritage protection objectives, the needs of local development, and other activities are coordinated in terms of spatial planning.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guideline which has an impact on ensuring comprehensive cultural heritage conservation:

- the determination of areas for the production of renewable energy sources, where exploitable potentials may be utilised in the most optimum manner, i.e. by taking into consideration the restrictions due to the protection of habitats, natural valuable features, cultural heritage and ecological connectivity, and recognisable settlement and landscape features, and by taking into consideration the acceptability in the local environment, particularly due to impacts on the health and the quality of life of the population, are taken into account.

In general, the impact of the guidelines for providing spatial capacities for a low-carbon society on comprehensive cultural heritage conservation is positive. By increasing energy efficiency, the need for new electrical power production facilities will decrease and, as a result, the pressure to build energy production facilities in cultural heritage areas will also decrease. However, to increase energy efficiency, the existing dwelling stock will have to undergo energy-saving renovation. The buildings that have recognisable architectural elements or are protected as cultural heritage cannot usually undergo a comprehensive energy-saving renovation in a manner that would not negatively affect the protected assets. The authors of the Environmental Report therefore recognise that the treatment of cultural heritage buildings in terms of energy-saving renovation in SDSS 2050 is lacking, so we recommend that SDSS, specifically the text under indent three of Priority P1: 'Improve efficient use of spatial potentials while observing spatial constraints', be amended, while the **vulnerabilities of architectural heritage** within comprehensive renovations **be observed at the same time**. Furthermore, the following materials must also be taken into consideration when planning and implementing a more detailed plan or intervention:

- Guidelines for Energy Renovation of Cultural Heritage Buildings (Smernice za energetska prenova stavb kulturne dediščine), 2016. Ministry of Infrastructure, Ministry of Culture.
- Workshop materials: Opportunities for the Energy-Saving Renovation of Cultural Heritage Buildings in the Periods until 2030 and until 2050 (Možnosti za energetska prenova stavb kulturne dediščine v obdobjih do leta 2030 in do leta 2050), Ministry of Culture, 2019.

The comprehensive assessment of guidelines for special areas and applications on the provision of comprehensive cultural heritage conservation: guidelines for special areas and applications have a positive impact (grade A) on providing comprehensive cultural heritage conservation.

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The greatest impact during construction is expected in the development of the road and railway networks, while development in the water and air transport networks will be negligible and limited only to the construction of facilities (buildings) on land.

The development of transport infrastructure impacts units and areas of cultural heritage directly during the construction and operation of new infrastructure connections by:

- degrading landscape features of the surroundings of units of cultural heritage (indirect, irreversible impact);
- damaging cultural heritage facilities (direct, reversible impact);
- destroying archaeological remains during construction (direct, local, irreversible impact);
- destroying archaeological remains during the construction of navigable waterways and ports (direct, local, irreversible impact);
- vibrations that may cause damage to cultural heritage buildings (indirect, reversible impact);
- gas emissions, since nitrogen oxides and sulphur dioxide are the components of acid rain that cause damage to buildings and monuments (indirect, cumulative, remote impact).

Since there are many cultural heritage units in the Slovenian territory, there is a great probability that new construction in road and rail transport will encroach on cultural heritage areas, especially cultural landscapes, historical landscapes, architectural heritage and their areas of influence, as well as archaeological sites. The positioning of transport infrastructure will permanently change the use of space in these areas. Therefore, adequate measures to preserve the features of cultural heritage areas must be implemented. From the aspect of preserving archaeological remains, activities in the environment are considered destructive acts (e.g. excavation). Extensive preliminary archaeological research will have to be carried out, its results will have to be taken into account when siting transport infrastructure, and measures to preserve archaeological remains will have to be implemented.

In addition to direct impacts, the implementation of transport policy measures can also affect cultural heritage through indirect impacts: by degrading landscape features in the surroundings of units of cultural heritage, vibrations that may cause damage to cultural heritage buildings, and exhaust gas emissions, since nitrogen oxides and sulphur dioxide are the components of acid rain that cause damage to buildings and monuments. In addition to being indirect, the impact of exhaust gas emissions may also be cumulative and remote.

During the operation, these measures may also have a positive direct impact on cultural heritage. Better accessibility to historically and culturally important areas will result in more visitors. On the other hand, a positive direct impact may quickly turn into a negative impact. More visitors may produce more waste and increase noise pollution.

The impact of the guidelines for transport infrastructure on providing comprehensive cultural heritage preservation is assessed as insignificant due to the implementation of mitigating measures (grade C).

General mitigating measures of the guidelines for developing transport infrastructure for achieving the goal of providing comprehensive cultural heritage preservation:

The development of transport infrastructure may impact units and areas of culture especially in terms of the degradation of landscape features of the surroundings of cultural heritage units, damage to cultural heritage facilities, and the destruction of archaeological remains during the construction of facilities by vibrations which could cause damage to buildings of cultural heritage. To avoid these impacts, the following must be considered:

- infrastructure corridors should not be placed in areas of cultural heritage as a priority.
- from the aspect of preserving archaeological remains, activities in the environment are considered destructive acts (e.g. excavation). Extensive preliminary archaeological research will have to be carried out, its results will have to be taken into account when siting transport infrastructure, and measures to preserve archaeological remains will have to be implemented.

- When integrating transport infrastructure into the environment, upgrading within existing transport corridors has priority over new construction.

The provided general mitigation measures for attaining the goal (16) 'Ensure comprehensive cultural heritage preservation' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **status of areas and structures of cultural heritage:** in addition to quantitative data about the areas and structures of cultural heritage, the indicator also consists of an expert opinion.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

In general, the impact of the guidelines for developing energy infrastructure to support a transition into a low-carbon society on cultural heritage is positive. The use of fossil fuels is decreasing, and with it environmental pollution through greenhouse gas emissions and other emissions into the air. The siting of facilities for utilising renewable and low-carbon energy sources and its accompanying infrastructure in the environment may also have an impact.

HYDROELECTRIC ENERGY

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address cultural heritage preservation, but their impact is indirectly expressed through the following guidelines:

- before planning new hydroelectric energy facilities, the possibility of renovating and upgrading existing energy facilities is taken advantage of as a priority, whereby cultural heritage preservation is ensured to the greatest possible extent;
- enabling the renovation and technological upgrade of the existing hydroelectric power plants on the rivers Drava and Sava;
- the planned chain of hydroelectric power plants on the River Sava's middle course and the potential utilisation of the hydroelectric potential on the section between Brežice and Mokrice;
- potential construction of the Drava–Kozjak pumped storage power plant;
- the hydroelectric energy use of individual watercourses or their parts with small hydroelectric power plants, with the verification of the exploitable hydroelectric energy potential, spatial capacities for the use of existing dams, requirements for the protection of aquatic and riparian habitats, water protection, ecological connectivity, and the preservation of landscape recognisability.

The impact⁹⁸ of the construction of hydroelectric power plants on the cultural heritage is reflected as the destruction or damage to individual elements that require protection. The direct impact can occur

⁹⁸ Warning regarding the assessment of the impacts of large hydroelectric power plants: Individual construction projects have not been assessed and they will need to be assessed at the following level. It is possible that, for some projects, the impact will be assessed as significant and that, even once the procedure for the dominance of other public benefit has been carried out, they will not be implemented or will be implemented at a limited scale. By adopting the SDSS, the dominance of other public benefit has not yet been proven, but is only determined

because of flooding some individual areas, rising groundwater (and resulting damage of archaeological remains, foundations of buildings of heritage) and the implementation of construction works (construction of dams, supporting infrastructure arrangements). The destruction of or damage to archaeological remains discovered during the construction are possible. Cultural heritage structures and areas in the impact area of the activities can mainly be affected indirectly (due to the proximity of the construction site, new arrangements in the immediate vicinity, the rise in groundwater, obstructed or blocked lines of sight of these structures during construction or after, etc.). In the renovation of existing hydroelectric power plants, which are defined as heritage, there can be an indirect impact on protected features. The exploitation of water power with the help of small water plants, small hydroelectric power plants, can also have a positive impact on cultural heritage. Cultural heritage is preserved by renovating former mills and sawmills pursuant to protection regimes.

WIND ENERGY

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address cultural heritage preservation, but their impact is indirectly expressed through the following guidelines:

- the installation of micro, small, medium-sized, or large wind turbines taking into account wind potential, the conditions and limitations related to cultural heritage protection and the protection of the recognisable features of the landscape, and the distance from settlements;
- the potential areas for installing medium-sized, small, and micro wind turbines are: areas within settlements, area with infrastructure facilities, and areas with agricultural land, areas outside of sensitive areas for birds, and outside of areas where the recognisability of settlements and the landscape is preserved.

Most of the impacts of installing wind turbines in areas with cultural heritage units, including archaeological heritage, can be the result of a physical activity and the resulting damage during construction work. The impact may result from changes to the characteristic image of the areas with cultural heritage units and their general area of influence or due to disturbed views of cultural heritage units and areas. These impacts are particularly pronounced in areas of cultural landscape. Potential areas for installing wind turbines encompass mountainous areas with usually few heritage units, with the exception of favourable areas in terms of wind, which largely reach into areas with a greater concentration of heritage units. The cultural heritage areas and units located within potential areas for installing wind turbines must be taken into consideration during the detailed siting of wind turbines.

GEOTHERMAL ENERGY AND AMBIENT HEAT

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address cultural heritage preservation, but their impact is indirectly expressed through the following guideline:

- the entire area of Slovenia is suitable for utilising ambient heat through heat pumps, while all construction land plots are priority areas for the use of heat pumps, provided that it is verified beforehand whether there is sufficient electrical power supply.

BIOMASS

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address cultural heritage preservation, but their impact is indirectly expressed through the following guidelines:

- encouraging the use of biomass as a priority in district heating systems in wider urban areas, other areas for functional integration, and in larger towns/cities with a relatively high concentration of settlement,

once a detailed assessment of individual hydroelectric power plant construction projects has been carried out, taking into account the absence of other alternative solutions and possibilities for taking suitable countervailing measures.

- planning decentralised individual wood biomass systems in the area of small towns/cities with a low concentration of settlement and outside of areas endangered due to pollution with PM10 particles or poorer wind exposure.

We assume that the use of forest biomass in the future will also be in accordance with the status of growing stock and the increment of growing stock in forests, and thus will not have adverse impacts on the visible characteristic of cultural heritage areas. The facilities themselves must be planned in accordance with spatial planning acts, so an impact on cultural heritage units is not to be expected.

SOLAR ENERGY

The guidelines which have an impact on ensuring comprehensive cultural heritage conservation:

- areas with construction land are priority areas for the use of solar energy. This particularly includes roofs and façades of buildings, infrastructure facilities, particularly car parks, road and rail corridors, public lighting, and degraded (brownfield) areas within the scope of their renovation, provided that such form of renovation is acceptable in terms of environmental and nature protection and the preservation of the recognisability of the landscape,
- *taking into consideration guidelines for protecting cultural heritage*, urban and architectural recognisability when determining priority areas for utilising solar energy,
- spatial capacities and restrictions related to the use of solar energy on construction land, infrastructure facilities, and degraded areas (brownfields) need to be verified taking into account the limitations in the field of cultural heritage, nature protection, the living environment, the recognisability of the landscape, and the acceptability in the local environment.

Installation of solar power plants and solar thermal collectors on buildings of architectural heritage can constitute a devaluation of the protected heritage features. The shape of the roof and roof elements are generally protected elements of the buildings heritage; by installing the equipment for the use of solar energy significant alterations to the image of the building can occur. A negative impact on the image of heritage buildings in a wider area may also occur in the event of placement of solar power plants and solar thermal collectors in impact areas of heritage sites and in heritage cultural and historical landscapes.

The impacts of guidelines for developing energy infrastructure to support the transition to a low-carbon society on providing comprehensive cultural heritage preservation have been assessed as insignificant under the conditions (grade C).

General mitigating measures of the guidelines for developing energy infrastructure to support a transition into a low-carbon society for achieving the goal of providing comprehensive cultural heritage preservation:

Strategic guidelines for siting hydroelectric power plants:

- According to the fundamental protection premise, small hydroelectric power plant and hydroelectric power plant locations must avoid cultural heritage units, while solutions must preserve the protected characteristics of the affected cultural heritage units by taking into consideration their legal protection regimes, i.e. ordinances on protection in the event of affected cultural monuments.
- Structures and areas of cultural heritage must also be protected from damage or destruction during construction; no construction access ways or detours should run across structures and areas of cultural heritage; the latter must not be overlapped by any necessary rearrangements of waterways or irrigation systems, public utility, energy or telecommunications infrastructure, nor may they be used to dispose of surplus materials, etc.
- In the detailed planning of hydroelectric power plants and associated infrastructure, some preliminary archaeological research will probably be necessary, when required, and also adjustments to the solutions of the spatial planning act, rescue excavations, and the presentation of the remains at the discovery site.

Strategic guidelines for siting wind power plants:

- In the areas of individual turbines and the associated infrastructure, prior archaeological research will be required.
- The fundamental protection platform is that wind power plants must avoid protected areas and structures of cultural heritage, while the solutions must observe the preservation of protected heritage features. If this is not possible, the protection regime and policies must be taken into consideration in order to prevent the impact or suitably reduce it.
- It is estimated that at the stage of individual turbine siting, adjustments to (avoiding) individual heritage structures and areas will be possible, since there is relatively plenty of potential for coordination and optimisation. Impacts on the visual image of heritage in the broader locality are to be mitigated by observing the general mitigation measures for landscape protection (see chapter Landscape).

Strategic guidelines for utilising solar power:

Spatial planning documents should lay down the conditions for implementing spatial planning in such a way that will make the installation of solar thermal collectors or concentrators on cultural heritage structures or in cultural heritage areas and their impact areas impermissible, or stipulate the assessment of the acceptability of respective cases and the provision of a technological solution that will ensure the protected heritage features are not affected in any way. Persons responsible for drafting spatial planning documents are also responsible for the implementation. The Sector for Strategic Environmental Impact Assessment of the ministry competent for culture verifies the appropriateness of the siting in the procedure for comprehensively assessing the impacts on the environment.

The provided general mitigation measures for attaining the goal (16) 'Ensure comprehensive cultural heritage preservation' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **status of areas and structures of cultural heritage:** in addition to quantitative data about the areas and structures of cultural heritage, the indicator also consists of an expert opinion.

2.3 GUIDELINES FOR ENERGY NETWORKS

The impact of the construction of power lines, cable conduits, or installing transformer stations on the cultural heritage is reflected in the destruction of, or damage to buildings of cultural heritage or individual elements that require protection. Along the cable conduits and at the pylon sites of long-distance cables, archaeological remains could be destroyed or damaged. The expansion of a distribution gas network to the regions which have thus far not been covered will have an impact, as the installation of lines will affect open space and thus increase the possibility of affecting cultural heritage areas, particularly archaeological remains.

Adjustments and the further development of transmission and distribution networks as well as the transmission gas network will usually be carried out along existing routes of electrical lines and gas pipelines, so that the impacts on cultural heritage, taking into account mitigating measures and legal cultural heritage protection regimes, are as minor as possible (grade C).

General mitigating measures of the guidelines for energy networks for achieving the goal of providing comprehensive cultural heritage preservation:

If the expansion and upgrade of transmission and distribution networks is not possible on the existing power line routes and they affect open space, the following should be taken into account:

- When siting new structures in space, the principles of protection of cultural heritage should be respected when planning in more detail – especially the principle of avoiding structures and areas of cultural heritage; individual protected heritage features should also be taken into account in the same manner.
- In areas of pylon sites or along cable conduit routes, ex ante archaeological research should usually be carried out, and, if necessary, an optimisation of the intervention, so as to avoid unnecessary interventions in archaeological remains.

The provided general mitigation measures for attaining the goal (16) 'Ensure comprehensive cultural heritage preservation' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **status of areas and structures of cultural heritage:** in addition to quantitative data about the areas and structures of cultural heritage, the indicator also consists of an expert opinion.

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

The purpose of utilising indigenous mineral raw materials is, according to SDSS guidelines, providing traditional building materials relevant to the restoration of cultural heritage, and the preservation of the recognisability of settlements and the landscape. By increasing the use of recycled sources and secondary raw materials for construction needs, the pressure to open new jobs for exploiting mineral raw materials for construction decreases, which, in turn, reduces the possibility of affecting cultural heritage units and their areas of influence.

The impact of the guidelines for protecting and supplying mineral raw materials on providing comprehensive cultural heritage preservation has been assessed as insignificant (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The impact on the environmental objective for cultural heritage is described in greater detail in the chapter titled '1.3 Guidelines for rural development' within 'Set 1 – Guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development'.

Cumulative impact of the guidelines for rural development, agriculture, forestry, and fisheries on providing comprehensive cultural heritage preservation has been assessed as insignificant (grade A).

2.6 GUIDELINES FOR NATURE CONSERVATION

In general, the impact of the guidelines for nature conservation on comprehensive cultural heritage preservation is positive. Cultural heritage areas are also located in protected nature areas, where the pressure caused by spatial development due to the planned guidelines will indirectly decrease. *We assess that the impact of the guidelines for nature conservation on the environmental objective is positive or that there is no impact (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. *The impact of the guidelines for tourism development on providing comprehensive cultural heritage preservation is insignificant (grade A).*

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

The SDSS 2050 guidelines for defence activities refer to the planning of replacement and new infrastructure for defence activities. In accordance with these guidelines, special attention is paid to suitable siting, reducing environmental impacts, and ensuring the required safety distance from residential areas, economic and service activities, cultural heritage and important nature protection areas. *We assess that the guidelines for defence activities will not have an impact on the environmental objective (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The SDSS 2050 guidelines for preventive protection against natural and other disasters refer to the protection against natural and other disasters, and priority support for preventive conduct and measures, particularly in the field of spatial planning, water management, the transport of hazardous substances, building construction. Activities, interventions and land use outside of endangered areas are planned in accordance with these guidelines to prevent natural disasters, material damage or casualties. *Guidelines for preventive protection against natural and other disasters do not have a direct impact on comprehensive cultural heritage preservation (grade A).*

7.2.9 LANDSCAPE

Environmental objective 17: Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level, and a quality landscape image

Within SDSS 2050, landscape is discussed in multiple ways, mainly as green infrastructure (physical, functional aspect) at a state, regional, and local level, enabling the multi-functionality of space and living quality, as an element of national, regional, and local recognisability (perception aspect), and identity in rural and urban areas, as well as a planning element (landscape design).

The Strategy provides general guidelines as a part of the guidelines for preserving and improving the recognisability of settlements and the landscape, areas of exceptional landscape, and landscape areas with distinctive features, and the measures defined in greater detail will be a part of the Action Programme for the Implementation of the SDSS.

SDSS 2050 defines green infrastructure as a strategically designed network of natural and semi-natural areas and the connections between them, which is designed and managed for the purpose of ensuring a wide spectrum of ecosystem services. It includes green and water surfaces as well as other landscape elements that ensure the preservation of biodiversity and, at the same time, increase the resilience of the environment to climate change, improve the functioning of the ecosystem, or provide other benefits for the population and the economy, particularly for health, quality of life, and preserving sources and the recognisability of space. The key properties of the green infrastructure network are the diversity of areas, morphological or functional connectedness, and the multi-functionality of individual areas. It connects urban and rural areas. At a regional level, green infrastructure consists of the green systems of regions, while at the local level it consists of the green systems of settlements, which are properly inter-connected in terms of functionality. The term 'green infrastructure' does not conceptually replace the term 'landscape', but has been increasingly established as a systemic approach to landscape design, seeking to utilise the potentials of landscape for meeting social, economic, and environmental needs. Green infrastructure is a framework concept that supports the understanding of landscape as a continuum, as it focuses on the continuity of areas. Individual parts (of the landscape) perform various functions, and it is green infrastructure that recognises this complexity and connects it into a system. Individual landscape areas with distinctive features (e.g. exceptional landscape, areas of recognisability) are therefore treated in a broader context from the perspective of green infrastructure, but can still be subject to special treatment.

In addition to green infrastructure, which mainly refers to the physical and functional manifestations of landscape structures and their operationalisation in terms of design, SDSS 2050 also discusses the term 'recognisability', which mainly addresses the perception aspect of landscape. The recognisability of space is the property of space that results from physical, cultural, and natural elements and is the result of respectful and prudent urban and landscape development and the inherited values in society. The recognisability of space contributes to its attractiveness, the quality of life, and it represents the elements through which people identify with their national territory and its parts and their significance.

The relationship between the landscape and the basic concepts used in SDSS 2050, i.e. between green infrastructure and recognisability (of landscape), is defined in greater detail in a document titled *Mnenje o obravnavi krajine v osnutku SPRS* ('Opinion on the Treatment of Landscape in the Draft of the SDSS' – Mojca Golobič, Nadja Penko Seidl, University of Ljubljana, Faculty of Biotechnology, Department of Landscape Architecture).

Set 1 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development

1.1 GUIDELINES FOR PLANNING AND DEVELOPING SETTLEMENTS

The guidelines for planning and developing settlements do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level, but their impact is indirectly expressed through the following guidelines:

- settlements are planned primarily through renovation and internal development within the area of existing settlements, reducing the share and size of degraded areas (brownfields), and spatial identity is enhanced;
- further expansion of individual settlements is prevented, only existing individual settlements that comprise less than ten residential buildings are preserved (outside of endangered areas);
- withdrawing settlements and infrastructure from endangered areas, and preserving and establishing overflow areas;
- establishing natural safeguards against extreme events and heat islands *with more well-maintained green areas* as elements of the green infrastructure, the green system of regions and towns;
- the definition of the distinctive features of settlements and the landscape and taking them into consideration when drafting spatial planning acts, decrees regarding the appearance of settlements and the landscape, and new spatial planning regimes that must *preserve regional and local identities of space*;
- to improve the recognisability of settlements and the landscape, *separative green belts are introduced between settlements* as part of a settlement's green system that connects to the green system of the region; no permanent interventions affecting these green belts are carried out;
- the planning of rural settlements is carried out as a priority through the renovation and internal development of settlements, together with the renovation of mobility, supply with energy and other sources, taking into consideration the guidelines concerning the protection of cultural heritage and the environment and the recognisability of settlements and the landscape;
- within the units of individual settlement in the countryside, the existing dwelling stock may exceptionally be complemented through individual new construction projects, taking into consideration the guidelines for the recognisability of settlements and the landscape and the protection of nature and resources, provided that these projects are performed within the scope of modernising existing activities;
- in the rural areas in which tourism is being developed, recognisability in terms of design is being maintained and created, *preserving traditional structure*;
- priority provision of areas for residential buildings by restoring degraded areas or existing low-density residential areas, while *providing sufficient open public built-up and green areas*;
- when planning, renewing, and building residential areas, the principles of a high-quality living environment are observed, ensuring a suitable density of development and architectural design of the entire residential area as well as of individual buildings;
- priority siting of economic and business zones within the scope of the internal development of settlements in abandoned industrial, municipal, transport and similar degraded areas or in existing economic and business zones;
- areas for economic development must have a high proportion of green areas as an element of good working conditions, adaptation to climate change, and *mitigating visible* or environmental *impacts*;
- priority siting of new shopping centres in degraded areas in urban settlements or on land which may be used for this purpose within the internal development of settlements as part of functional reorganisation or urban renovation of settlements or their sections;
- concentrating urban structures near transport hubs, terminals, and public passenger transport stops, whereby from 20 to 30 percent of the area is dedicated to open public built-up surfaces, and at least 15 percent of the area is dedicated to public green surfaces;

- preventing the changing of open public built-up surfaces and green surfaces into surfaces for parking vehicles.

By preserving and establishing the recognisability of the landscape, greater attractiveness of areas, specific development possibilities, a high-quality living environment, and possibilities for people to identify with their national territory are ensured. The recognisability and experiential value of Slovenian landscape are formed by a diverse cultural landscape, urban and architectural heritage in the countryside dependent on climate, geological, relief, and historical conditions, and natural values with distinctive and recognisable features.

Determining the impact on the quality of landscape primarily stems from the visible features of space and characteristic landscape elements present in space. The landscape is most burdened by infrastructure (roads, transmission lines, accompanying infrastructure facilities) and the spreading of development into open space where, due to its greater level of preservation, impacts are that much more visible. The planning and development of settlements can have an impact of the landscape and visible characteristics of space, particularly due to siting new structures, activities, and infrastructure into space. Considering SDSS guidelines, planning settlements is performed as a priority by way of renovation and internal development in the area of existing settlements, taking into account the requirements concerning the protection of cultural heritage, the environment, and the recognisability of settlements and the landscape, whereby the proportion and surface of degraded areas (brownfields) is reduced, positively affecting the quality of the landscape image and preventing the spread of settlements to areas of exceptional landscape and to landscape areas with distinctive features. Moreover, the further spread of individual settlement is prevented and settlement and infrastructure are removed from endangered areas. The priority provision of surfaces for residential construction, economic and business zones, and new shopping centres in degraded areas (brownfields) within the internal development of settlements or by way of the renovation of existing residential areas, economic/business zones, and shopping centres has a positive impact, while also providing sufficient open public built-up and green surfaces.

The definition of the distinctive features of settlements and the landscape and taking them into consideration when drafting spatial planning acts, decrees regarding the appearance of settlements and the landscape, and new spatial planning regimes that must preserve regional and local identities of space has a positive impact. The following also has a positive impact on ensuring a high-quality landscape image: providing a greater proportion of well-maintained green areas as elements of green infrastructure, a green system of regions and towns/cities, establishing green separative belts between settlements as a part of a green system of a town/city, which is connected to the green system of the region and on which no permanent interventions have an impact, and preventing the changing of open public built-up surfaces and green surfaces into surfaces for parking vehicles.

Maintaining and creating recognisability in settlements in terms of design, which preserves the traditional structure, as well as the architectural design of an entire residential area and individual buildings have a positive impact; this indicates the concern for the high quality of architecture of publicly-owned buildings and infrastructure, the image of towns/cities and rural settlements, creating a spatial planning regime, preserving spatial heritage, and a harmonious image of the landscape.

The SDSS 2050 guidelines are designed so that the impact on providing the preservation of exceptional landscape and landscape areas with distinctive properties at a national level and on a high-quality landscape image is as small as possible. The impact on planning and developing settlements has been assessed as insignificant (grade B).

1.2 GUIDELINES FOR URBAN DEVELOPMENT

The guidelines for urban development do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and of a high-quality landscape image, but their impact is indirectly expressed through the following guidelines:

- providing a sufficient scope of open public built-up and green surfaces during renovations or expansions of urban settlements;
- the priority provision of residential areas, areas for social infrastructure, and areas for the needs of the economy by renovating existing degraded areas (brownfields) that have already undergone urban planning, without endangering the quality of the living environment.

The state of the quality of Slovenian space is quite favourable. Nevertheless, there are a number of degraded areas (brownfields), which are the results of the needs of modern society, i.e. of infrastructural interventions, the unilateral use of space, improper technologies, and/or improper locations for individual uses of space. The consequence of this are changes in landscape structure and fragmentation, the breakup of larger continuous areas into smaller ones, leading to the loss of regional and local characteristics of landscape types.

the spreading of urban settlements and accompanying infrastructure can have an impact; however, this impact is insignificant due to the priority provision of residential areas, areas for social infrastructure, and areas for the needs of the economy by renovating existing degraded areas (brownfields) that have already undergone urban planning, without endangering the quality of the living environment. Providing a sufficient scope of open public built-up and green surfaces during renovations or expansions of urban settlements and connecting green surfaces into a green system of settlements and the region, whereby landscape areas with distinctive features are preserved and the quality of the landscape image of an area is improved, has a positive impact on the high-quality landscape image.

We assess that the impact of the guideline for urban development on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and on the high quality of the landscape image is insignificant (grade B).

1.3 GUIDELINES FOR RURAL DEVELOPMENT

The guidelines for rural development do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and of the high quality of the landscape image, but their impact is indirectly expressed through the following guidelines:

- enhancing the use of renewable energy sources for local development and providing suitable support infrastructure, while *taking into account limitations to preserve spatial identity, the recognisability of settlements and the landscape;*
- the priority planning of rural settlements by way of renovation and internal development, taking into consideration the requirements concerning the protection of cultural heritage and the environment, *the adjustment to the regional and local identity and the recognisability of settlements and the landscape;*
- adjusting the planning of settlements and road infrastructure to the characteristics of settlements and villages by *maintaining the recognisability of settlements and the landscape;*
- withdrawing settlements from endangered areas;
- new activities in the countryside must contribute to reducing the vulnerability and the endangerment of structures and the population, improving the condition of the environment and the quality of life of people, and to *preserving the recognisability of settlements and the landscape;*
- special attention is paid to *planning open space* in rural settlements and the concern for the recognisability of settlements and the landscape;
- spatial capacities for developing agricultural holdings is sought as a priority within existing rural settlements and villages;
- *increasing the proportion of green surfaces*, enhancing the role of the green systems of settlements, and the suitable connection to the green systems of regions;

- there is a concern for *preserving landscape elements* in open space, which contribute to the protection of ground and land from erosion;
- the priority *preservation* and use of *agricultural land* in a way that enables the long-term preservation of the land's permanent fertility for food production and landscape preservation;
- comprehensive planning of agricultural space, taking into consideration the *preservation of landscape recognisability*;
- the adjustment of agricultural production to modern methods, while also *taking into consideration the characteristics of the cultural landscape and the preservation of the most important elements of recognisability*;
- in order to limit the reduction of agricultural land, its overgrowth is prevented and productivity is maintained;
- the *preservation* of forest patches and other landscape elements in flat areas, which are important as elements with *landscape structural significance*;
- agricultural activities are coordinated with a potential multi-functional role of agricultural areas in the green system of a region and settlement;
- including the forest into the green systems of regions and towns/cities;
- *preserving continuous forest complexes* for protecting exposed hillsides or in endangered areas;
- siting wood processing plants for implementing the economic role of forestry;
- water infrastructure is sited pursuant to natural morphology into less visibly exposed locations, whereby such materials are usually used that ensure that the *negative visual impact is as small as possible*;
- when using mineral raw materials, efforts are made to gradually close down smaller facilities and to rehabilitate illegal excavation sites, with the priority *rehabilitation of excavation sites in areas with landscape recognisability*, nature protection areas, or cultural heritage areas;
- new facilities for obtaining mineral raw materials are only opened if there is an increased demand in the country that cannot be met through already opened facilities.

Rural development can have an impact on the landscape features and visible features of space, mainly due to siting new facilities and infrastructure into space, abandoning activities or excessively performing activities, such as agriculture and forestry, and the resulting overgrowth of areas and extensive timber felling. The impact is seen in the decreased quality of the existing landscape image and the endangered integrity of areas of exceptional landscape and landscape areas with distinctive features at a national level and the change in their characteristics.

The impact of planning and developing rural settlements is described in greater detail in chapter 1 'Planning and developing settlements', where the impact of the guidelines on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and of a high-quality landscape image is assessed as insignificant. The assessment is based on the priority planning of rural settlements through renovation and internal development, taking into consideration the requirements concerning the protection of cultural heritage and the environment, adjusting to the regional and local identity, the recognisability of settlements and the landscape, and adjusting the planning of settlements and road infrastructure to the characteristics of settlements and villages by maintaining the recognisability of settlements and the landscape.

Planning open space in rural settlements and the concern for the recognisability of settlements and the landscape have a positive impact. This impact is seen in the enhancement of the role of the green systems of settlements and the suitable connection to the green system of the region, the preservation of landscape elements in open space, the comprehensive planning of agricultural space, taking into consideration the preservation of landscape recognisability, the preservation and use of agricultural land in a way that enables the long-term preservation of the land's permanent fertility for food production and landscape preservation, the prevention of the overgrowth of agricultural land and the preservation of its productivity, the preservation of forest patches and other landscape elements in flat areas, which are important as elements with landscape structural significance, and the preservation of continuous forest complexes.

Managing natural resources and developing activities in the countryside also have an impact on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and of a high-quality landscape image. This impact is positive because existing and new activities in the countryside must contribute to reducing the vulnerability and the endangerment of structures and the population, improving the condition of the environment and the quality of life of people, and to preserving the recognisability of settlements and the landscape. The use of natural resources also has an impact, whereby the siting of suitable infrastructure into space has an even greater impact. Siting water infrastructure pursuant to natural morphology into less visibly exposed locations, whereby such materials are usually used that ensure that the negative visual impact is as small as possible, and enhancing the use of renewable energy sources for local development and providing suitable support infrastructure, while taking into account limitations to preserve spatial identity, the recognisability of settlements and the landscape are also planned. When using mineral raw materials, efforts are made to gradually close down smaller facilities and to rehabilitate illegal excavation sites, with the priority rehabilitation of excavation sites in areas with landscape recognisability, nature protection areas, or cultural heritage areas, which preserves or improves the quality of the landscape image of the area.

We assess that the impact of the guidelines for rural development on ensuring the preservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image is insignificant (grade B).

1.4 GUIDELINES FOR GREEN INFRASTRUCTURE AT REGIONAL AND LOCAL LEVELS

The guidelines for green infrastructure at regional and local levels do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level, but their impact is indirectly expressed through the following guidelines:

- the green system of the region is used to ensure the multi-functionality of space at a regional level, *the recognisability of landscape*, the adjustment to climate change, the natural restoration of ecosystems, and recreation in open space;
- *the existing landscape elements, the conditions for the preservation, and guidelines* are defined within the planning of the green system of the region;
- the planning of infrastructure or spatial development regimes must be adjusted to the requirements for preserving ecological connectivity in the green system of the region;
- the green systems of settlements include landscape elements and individual parts of the open space in the area of individual settlements, which are inseparably connected to their structure and function, appearance and identity, the quality of the living environment, and the adjustment to climate change (e.g. a park, children's playgrounds, greenery in neighbourhoods, urban forests, avenues of trees, water surfaces and areas next to them, vegetation, meadows, individual trees);
- *separative green belts* between settlements and *green roofs* are also included in the green system of settlements.

Green infrastructure connects urban and rural areas and ensures the preservation of biodiversity, adapting to climate change, the recognisability of the landscape, and recreation in open space. The definition of existing landscape elements and the conditions for their preservation within the green system of the region as well as the inclusion of landscape elements and individual parts of open space, which are inseparably connected to the structure of a settlement and its functioning, image, and identity, into the green systems of settlements.

Due to the priority preservation of spatial identity (regional, local), the landscape features, and the quality of the landscape image, we assess that the impact of the guidelines for green infrastructure at a regional and local level on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and the high-quality landscape image is *positive (grade A)*.

1.5 GUIDELINES FOR SPECIAL AREAS AND REGIONS

1.5.1 Guidelines for developing the sea and the coast

The guidelines for developing the sea and the coast do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level, but their impact is indirectly expressed through the following guidelines:

- developing the Port of Koper and the infrastructure in the inland areas of the coast is based, among other things, on *preserving open undeveloped space for green infrastructure*, which is functionally connected to the sea and the general inland area and the green systems of the coastal towns/cities and the green system of the region;
- enhancing mutual functional connections between coastal towns within the wider urban area, while also developing their own recognisable, attractive, and *modern identity respecting nature, tradition, and heritage*;
- the necessary upgrade and establishment of energy infrastructure, including a transmission gas network;
- areas for activities that are a burden from the environmental (waste water, oil, and lubricant discharges), spatial (changing the natural coast or coastal line, preventing direct access to the sea), or visual (obstructing *views of the sea* directly from the coast) aspects must be limited;
- establishing a coastal area along the length of the coast in which construction is not permitted and which is intended to *protect* nature/preserve natural habitats and *landscape*, natural resources and ecosystems, for ecological connections between inland areas and the sea, and the adaptation to climate change.

The coastal area is characterised by exceptional cultural landscape with special architectural feature, extensive Natura 2000 areas, nature protection areas, and salt pans, as well as by dense settlement and highly urbanised areas.

The urban development of coastal towns can affect landscape features and the visual features of space, mainly due to the siting of new facilities and infrastructure into space and performing activities related to the sea and the coast. SDSS guidelines foresee the development of the coast, while also preserving open undeveloped space for green infrastructure, which is functionally connected to the sea and the wider inland area of the coast as well as with the green system of coastal towns and the green system of the region, which reduces the impact on the landscape features and the visible features of space. Furthermore, areas for activities that are a burden for the sea and the coast due to waste water, oil, and lubricant discharges, changing the natural coast or coastal line, and obstructing views of the sea must be limited, which reduces the negative impacts on the environmental objective.

Establishing a coastal area along the length of the coast intended to protect nature/preserve natural habitats and landscape, natural resources and ecosystems, for ecological connections between inland areas and the sea, the adaptation to climate change, and is a part of the green system the coastal towns and the region has a positive impact.

1.5.2 Guidelines for tourist areas

The guidelines for tourist areas do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level, but their impact is indirectly expressed through the following guidelines:

- tourism development must not put resources and their quality at risk or irreversibly change them, either through infrastructure or due to visits, the *preserved recognisability of settlements and the landscape must be ensured*;
- sustainable tourism development is supported; it is based on connections between nature conservation, the *recognisability of settlements and the landscape*, cultural heritage and

culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility;

- tourism development does not open new areas for tourism, particularly not in naturally preserved areas and quiet natural areas, and in endangered, sensitive or water-scarce areas;
- tourist programmes and tourism development are coordinated with the protection goals in individual areas for protection, i.e. in nature parks and other protected areas and cultural heritage areas;
- in remote (mountain) and border areas, tourism can contribute to preserving settlement, which indirectly affects *nature conservation, cultural landscape conservation*, and forest management.

Slovenia is focused on sustainable tourism development which is based on connections between nature conservation, the recognisability of settlements and the landscape, cultural heritage and culture, prudent utilisation of environmental resources, and the promotion and establishment of sustainable mobility.

Siting tourism facilities and the accompanying infrastructure into space has an impact on preserving exceptional landscape and landscape areas with distinctive features at a national level and the high-quality landscape image. SDSS guidelines do not permit opening new areas for tourism and they particularly prevent the expansion into naturally preserved areas, focusing on developing tourist infrastructure in areas where key tourist infrastructure has already been provided, which reduces the negative impact on the environmental objective. An indirect negative impact on preserving the quality of the landscape image can be caused by the increased number of visitors to areas, which reflects in the form of pollution due to the increased amount of produced waste, traffic, and the distinctive features of areas can potentially be damaged/destroyed.

Coordinating tourist programmes and tourism development in nature parks and other areas for protection with the protection goals of individual areas can have a positive impact, which reduces the negative impacts of the planned development on the areas of exceptional landscape and landscape areas with distinctive features at a national level.

1.5.3 Guidelines for preserving and improving the recognisability of settlements and the landscape

The guidelines that have an impact on ensuring the conservation of exceptional landscapes and landscape areas with distinctive features at the national level, and a high-quality landscape image:

- *elements of recognisability* which are to be preserved and those which require improvement are *defined* separately in expert groundwork for the needs of spatial planning at a regional and local levels. *Distinctive landscape areas and areas of settlement with guidelines* can be separately defined;
- the recognisability of settlements is achieved by planned development and renovation, whereby the regional urban planning and architectural characteristics of individual areas, the preserved and recognisable construction culture from past periods, and the distinctive architectural creations with major testimonial value are taken into consideration;
- *when designing settlements, spatial characteristics* and the inherited cultural and natural values *are taken into account*, the design values of a settlement are stressed, the height requirements are adjusted to the existing structure, dominant views and skylines are protected, the connecting points between settlements and open landscape are carefully treated, and undeveloped open space between settlements is preserved;
- historical towns and cities and their parts are preserved by way of planned renovation, particularly those that are considered urban heritage;
- the development of settlements is adjusted to the geometry of the relief, the network of watercourses, the direction of communication and regulation, and to the directions and configuration of construction;

- when siting spatial regimes, distributing individual activities, land operations, or when planning agricultural land, forests, or water areas, *the elements of the recognisability of landscape are preserved or re-established*;
- more detailed guidelines for *preserving the recognisability of settlements and the landscape* are determined within the scope of planning at regional and local levels; areas of recognisability are also determined at the regional level.

The recognisability of space is based on physical, cultural, and natural elements and is the result of respectful and prudent urban and landscape development and the inherited values in society. In particular, non-rehabilitated anthropogenic interventions, such as opencast mineral raw material mines in flat areas or on hills, exposed surfaces and modified watercourses, visibly exposed buildings or structures built with improper forms, condition, or siting, the improper use in outskirts of settlements, or abandoned areas, e.g. due to depositing various types of soil, have a negative impact on the recognisability of landscape. SDSS guidelines direct the development, planning, renovation, and design of settlements and the siting of spatial planning regimes in a way that would enable protection goals to be achieved. Particularly the definition of the landscape recognisability elements that are being preserved, re-established, or those that require improvement has a positive impact. When designing settlements, spatial characteristics and the inherited natural values are taken into account, the design values of a settlement are stressed, the height requirements are adjusted to the existing structure, dominant views and skylines are protected, the connecting points between settlements and open landscape are carefully treated, and undeveloped open space between settlements is preserved, which also has a positive impact on the environmental objective.

1.5.4 Guidelines for nature protection areas and cultural heritage areas

The guidelines for nature protection areas and cultural heritage areas do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level, but their impact is indirectly expressed through the following guidelines:

- cultural heritage areas are an important and indivisible part of space and the heritage of the Republic of Slovenia and its regions, and they complement the quality of the living environment and are invaluable for the *recognisability of the landscape* and settlements;
- nature protection areas and cultural heritage areas are considered added value for regional and local development, as conserved nature and cultural heritage provide important ecosystem services and benefits, e.g. a good degree of conservation of the habitats of animal and plant species, the recovery of water sources, providing clean air, facilitating the physical and spiritual relaxation of people in a natural environment, they contribute to enhancing the *recognisability of the landscape*, improving the quality of the living environment, including improving the access to cultural goods, and offer potentials for additional development opportunities;
- in protected natural areas, particularly in *regional and landscape parks*, and in areas with immovable cultural heritage, particularly archaeological, urban, architectural, and *landscape heritage*, the performance of activities in protected areas and cultural heritage areas, particularly the development plans of all key sectors, must *support the achievement of nature conservation and cultural heritage protection objectives*;
- the development of broader protected areas of nature and cultural heritage as an integral spatial category, in which the fulfilment of nature protection objectives and cultural heritage protection objectives, the needs of local development, and other activities are coordinated in terms of spatial planning.

Protected areas are natural areas which are, among other things, also defined by significant landscape diversity. Cultural heritage areas are, on the other hand, invaluable for the recognisability of settlements and the landscape. The performance of activities in nature protection areas and cultural heritage areas will be regulated on the basis of SDSS guidelines so as to enable the achievement of protection goals.

1.5.5 Guidelines for providing spatial capacities for a low-carbon society

The guidelines for providing spatial capacities for a low-carbon society do not address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and a high-quality landscape image, but their impact is indirectly expressed through the following guidelines:

- in areas with sufficiently large consumption, the construction of new production units for the cogeneration of thermal and electrical energy and district heating systems that use the heat from cogeneration is encouraged;
- areas for the production of renewable energy sources are determined in places where exploitable potentials can be utilised in the most optimal way, i.e. *by taking into consideration the distinctive features of settlements and the landscape.*

By increasing energy efficiency, the pressure on the areas of exceptional landscape and landscape areas with distinctive features at a national level will be reduced, as the demand for new facilities for producing electrical energy will also be reduced. The construction of new production units for the cogeneration of heat and electrical energy and district heating systems can have an impact, which is expressed in the deteriorated quality of the landscape image.

The comprehensive assessment of guidelines for special areas and applications on the provision of comprehensive cultural heritage conservation: *guidelines for special areas and applications have a positive impact (grade A) on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and the high-quality landscape image.*

Set 2 of guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – for developing/drafting public policies

2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE

The guidelines for developing transport infrastructure do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and of the high quality of the landscape image, but their impact is indirectly expressed through the following guidelines:

- the development of transport infrastructure in connection with the planned spatial development according to area (urban, remote and mountain areas, rural areas, etc.);
- promoting inter-modal connections with the accompanying inter-modal infrastructure and the development of a rail network;
- enhancing sustainable mobility, while also reducing traffic and the impact of traffic on the environment;
- *adapting* public passenger transport infrastructure to *spatial typology and features* with the purpose of preserving the distinctive features of settlements and the landscape, *preventing the fragmentation of space*, reducing the negative impacts of transport on human health and the environment;
- the construction of a cycling network for daily migrations in the areas of towns, cities, and other urban settlements and in general urban areas and other areas of functional integration;
- the development of a network of pedestrian paths in tourist areas, which are connected to the cycling network, in order to ensure the *interconnection between attractive landscape areas*;
- the planning of transport infrastructure by adapting to the issue of accessibility and connectivity depending on the characteristics and needs of various areas;
- extending regional rail connections within wider urban areas;
- providing a continuous development of the aviation infrastructure and the infrastructure of navigation air transport services;
- developing the ports of Koper, Izola, Piran, and the river port of Brežice;

- developing cableway transport where other transport sub-systems cannot technologically perform their transport function due to the relief or where the use of other transport sub-systems may be temporarily suspended or interrupted due to weather or other conditions.

Landscape is most encroached on by transport connections that extend into open space where the impacts of transport are more noticeable due to a higher level of its preservation (permanent, irreversible impact). The impact is particularly great in the event of the construction of infrastructure in areas of exceptional landscape or landscape areas with distinctive features, and landscapes with preserved natural elements and exceptionally balanced cultural elements which have great symbolic meaning. Infrastructure facilities in space become elements of the landscape and part of its experience. Therefore, their arrangement must be in accordance with the existing types of landscapes. Taking into account the natural features and topography of the area of activity will reduce the fragmentation of landscape.

The planned development of public passenger transport infrastructure is adapted to *spatial typology and features* with the purpose of preserving the distinctive features of settlements and the landscape, *preventing the fragmentation of space*, and reducing the negative impacts of transport on human health and the environment. Nevertheless, the construction of infrastructure can affect an area of exceptional landscape and landscape areas with distinctive features at a national level, as there are no fewer than 93 areas of exceptional landscape and 60 landscape areas with distinctive features in the area of Slovenia. Due to infrastructure construction, the landscape is fragmented and, as a result, the regional and local characteristics of landscape are lost. By siting transport infrastructure into space, the quality of the landscape image of the area also deteriorates due to the changed landscape pattern, a structure/regime that exceeds the scope of spatial planning elements, changes to the natural relief of cultural landscape, absence of segmentation elements in the form of vegetation, and visibly exposed structures/regimes.

We assess that the impact of the guidelines for developing transport infrastructure on ensuring the preservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image is insignificant, taking into account mitigating measures (grade C).

General mitigating measures of the guidelines for developing transport infrastructure for achieving the goal 'Ensuring the preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image':

To ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image, the following guidelines must be pursued:

- infrastructure corridors should not be integrated into exceptional landscape areas or landscapes with distinctive features at the national level;
- Proper technical measures must be applied to provide a high-quality landscape image by pursuing natural and cultural features and the topography of the area, especially in the case of activities in naturally preserved and culturally rich landscape units.
- When integrating transport infrastructure into the environment, upgrading within existing transport corridors has priority over new construction.

The drafting of landscape designs at the lowest levels of planning, which include evaluation of the status and planning of protection and development of landscape recognisability elements is important for directing and a detailed determination of spatial development and protection in individual landscape areas.

The provided general mitigation measures for attaining the goal (17) 'Preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer

(Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such:** pursuant to the recast methodology within the target research project, exceptional landscape areas and landscape areas with distinctive features, and their number and scope will be determined anew and this will be the subject of the Action Programme for the Implementation of SDSS 2050.
- **actual use in exceptional landscape areas and landscape areas with distinctive features:** the selected indicator determines the change in the actual use of space in exceptional landscape areas and landscape areas with distinctive features, which is used to establish the trend of changing exceptional landscape areas and landscape areas with distinctive features. The authors of the Environmental Report have recognised the lack of an indicator for reference status in order to monitor changes of the actual use in exceptional landscape areas and landscape areas with distinctive features, and the lack of a reference status to monitor changes in other landscape areas. As a measure, we propose that their reference status be determined on the basis of the target research project 'Upgrade of the methodology for determining nationally recognised landscape areas' and the upgrade of the Regional Classification of Landscape Types in Slovenia (Marušič, I. 1998. Regionalna razdelitev krajinskih tipov v Sloveniji. Ljubljana, Ministry of the Environment and Spatial Planning, Spatial Planning Office of the Republic of Slovenia) within the Action Programme for the Implementation of SDSS 2050.

2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE TO SUPPORT THE TRANSITION TO A LOW-CARBON SOCIETY

The siting of facilities for utilising renewable and low-carbon energy sources and its accompanying infrastructure in the environment also has an impact on the environmental objective. The impact is reduced by the priority upgrade of existing energy facilities for improving energy efficiency and reducing environmental effects.

HYDROELECTRIC ENERGY

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level, but their impact is indirectly expressed through the following guidelines:

- renovation and technological upgrade of the existing hydroelectric power plants on the rivers Drava, Sava, and Soča;
- the planned chain of hydroelectric power plants on the River Sava's middle course and the potential utilisation of the hydroelectric potential on the section between Brežice and Mokrice;
- potential construction of the Drava–Kozjak pumped storage power plant;
- the hydroelectric energy use of individual watercourses or their parts with small hydroelectric power plants, with the verification of the exploitable hydroelectric energy potential, spatial capacities for the use of existing dams, requirements for the protection of aquatic and riparian habitats, water protection, ecological connectivity, and the *preservation of landscape recognisability*.

The placement of hydroelectric power plants as large-scale infrastructure and the implementation of all the accompanying arrangements may cause major changes in landscape structure and spatial relationships, and visibility elements of the space. Impacts of small hydroelectric power plants are of minor extent, but when they occur in a significant number and resulting in number of changes to riparian landscapes, their cumulative impact needs to be taken into account. During the construction the impacts on the landscape occur due to the removal of riparian vegetation, extensive earthworks (excavation of construction holes, construction of dam facilities and dams, regulation of dam constructions and of new banks, arrangement of tributaries, of temporary disposal of material in the riparian area, etc.) and to the presence of construction sites and machinery. Permanent impacts on the landscape are a consequence of placement of barriers and ancillary facilities and reservoirs, which generally represent a substantial expansion of existing river beds and a marked change of the character of these rivers. Due to rising levels, flooding of the rock bottom of the river bed and its banks occurs so the characteristic landscape elements – rocks, rapids and gravel bars are no longer visible. Impacts on the landscape are stronger in cases where the implementation of additional arrangements along the dam constructions is planned - energy and water economy embankments. Water bodies usually represent an asset that positively affects the quality of landscape image. It is therefore necessary to allow for the possibility that the accumulations may increase the visibility of the landscape. To the quality of landscape image, also a quality architecture of the barrier can contribute a lot. The placement of hydroelectric power plants as large-scale infrastructure and the implementation of all the accompanying arrangements cause major changes in landscape structure and spatial relationships, and visibility elements of the space. Impacts⁹⁹ can be mitigated by a comprehensive landscape architectural arrangement of the space along the dam construction and thus a new distinctive landscape can be established.

WIND ENERGY

The following guidelines in particular will impact the environmental objective:

- the installation of micro, small, medium-sized, or large wind turbines taking into account wind potential, the vulnerability of nature, *the recognisable features of the landscape*, and the distance from settlements;
- the potential areas for installing medium-sized, small, and micro wind turbines are: areas within settlements, area with infrastructure facilities, and areas with agricultural land, areas outside of sensitive areas for birds, and outside of areas where *the recognisability of settlements and the landscape is preserved*.

The most important permanent impact on the landscape due to the presence of wind turbines is changed landscape image and, consequently, of spatial relationships, symbolic values and culture of the space. The negative impacts of siting wind turbines on the landscape image are more pronounced in naturally better preserved landscape types, in landscape types with symbolic value, in areas with wider landscape recognisability, in open (grassy, rocky) landscape, or in areas with less diverse landscape where the level of visible absorption is smaller, in visibly exposed locations, and if a large number of wind turbines are installed in a continuous field of wind turbines. Individual wind turbines which are sited through detailed municipal spatial planning designs as well as wind farms with larger wind turbines can also have an impact on the change in the landscape image. The impact of wind farms on the landscape can be alleviated by optimizing the placement of wind turbines in the space and with their design.

⁹⁹ *Warning regarding the assessment of the impacts of large hydroelectric power plants: Individual construction projects have not been assessed and they will need to be assessed at the following level. It is possible that, for some projects, the impact will be assessed as significant and that, even once the procedure for the dominance of other public benefit has been carried out, they will not be implemented or will be implemented at a limited scale. By adopting the SDSS, the dominance of other public benefit has not yet been proven, but is only determined once a detailed assessment of individual hydroelectric power plant construction projects has been carried out, taking into account the absence of other alternative solutions and possibilities for taking suitable countervailing measures.*

GEOTHERMAL ENERGY AND AMBIENT HEAT

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and the high-quality landscape image, but their impact is indirectly expressed through the following guidelines:

- the entire area of Slovenia, particularly building land, is suitable for utilising ambient heat through heat pumps;
- the use of water surfaces for this purpose is only possible if it is environmentally acceptable.

BIOMASS

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and the high-quality landscape image, but their impact is indirectly expressed through the following guidelines:

- the priority promotion of the use of biomass in district energy systems in wider urban areas and in major densely populated settlements for district heating and in areas of economic zones with ensured consumption of thermal energy, provided that suitable air protection filters are used;
- planning decentralised individual wood biomass systems in the area of small towns/cities with a low concentration of settlement and outside of areas endangered due to pollution with PM10 particles or poorer wind exposure and in areas of economic zones and production areas;
- the priority planning of biogas systems in areas intended for agricultural and livestock production and in areas with municipal infrastructure, which can be directly connected to users.

We assume that the use of forest biomass in the future will also be in accordance with the status of growing stock and the increment of growing stock in forests, and thus will not have adverse impacts on the status of forests and their ecological functions and, consequently, on the characteristics of the forest landscape. We assume that the use of forest biomass will be in accordance with the status of growing stock and the increment of growing stock in forests, and thus will not have adverse impacts on the status of forests and, consequently, on the characteristics of the forest landscape.

SOLAR ENERGY

The guidelines for developing energy infrastructure to support a transition into a low-carbon society do not directly address the preservation of exceptional landscape and the landscape areas with distinctive features at a national level and the high-quality landscape image, but their impact is indirectly expressed through the following guidelines:

- Priority areas for the use of solar energy are areas with building land, particularly roofs and façades of buildings, infrastructure facilities, particularly car parks, road and rail corridors, public lighting, and degraded (brownfield) areas within the scope of their renovation, particularly abandoned areas where mineral raw materials were mined and waste deposit sites, provided that such form of renovation is acceptable in terms of environmental and nature protection and the *preservation of the recognisability of the landscape*;
- When determining priority areas for the use of solar energy on building land, the protection of urban and architectural recognisability is taken into consideration.

Placement of solar power plants and solar thermal collectors in the landscape represents the degradation of landscape elements and the landscape image. Given the possibility of placing solar power plants and solar thermal collectors on buildings it is estimated that placement in the landscape has no meaning, and in exceptional and distinctive landscape it is unacceptable. An exception might be the placement in degraded areas - such as a rehabilitation of landfills, opened mines within the industrial areas, logistic terminals, along the transport infrastructure facilities (for example in the simultaneous function of sound barriers), in case when they are not sites of nature conservation

importance or otherwise important, which is determined through a detailed assessment. Because the use of solar energy is planned on building land, infrastructural facilities, and in degraded areas (brownfields), taking into account the recognisability of the landscape, there is no impact on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and the high-quality landscape image or this impact is insignificant, taking into account mitigating measures.

The impacts of guidelines for developing energy infrastructure to support the transition to a low-carbon society on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and the high-quality landscape image are assessed as insignificant under the conditions (grade C).

General mitigating measures of the guidelines for developing energy infrastructure to support a transition into a low-carbon society for achieving the goal ‘Ensuring the preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image’:

Strategic guidelines for siting wind power plants:

- Individual wind turbines should be sited in the environment so as not to affect areas with distinctive landscape and exceptional landscape. Furthermore, when selecting a location, visibly exposed locations (mainly if wind turbines are in the “first plan” of the most frequent points of view), naturally preserved landscape, and open landscape (grassland, rocky landscape) should be avoided.
- When siting individual sites for wind farms and other mandatory accompanying infrastructure in potential areas for wind farms, the following should be taken into account: In locations where border sections of exceptional landscape are included in areas for wind turbines by virtue of making use of land with favourable wind conditions, special attention should be given to the details of turbine siting. The measures pertain to the optimisation of the siting of individual structures and plants for the utilisation of wind energy, or the accompanying infrastructure within individual potential areas for the construction of wind farms in the subsequent planning phases in a manner that will enable distinctive landscape features within individual areas to be preserved to the greatest extent possible, and that changes to the landscape image be as small as possible or such that the landscape image of areas with wind farms remains as coherent as possible.

Strategic guidelines for siting hydroelectric power plants:

As a priority, new small hydroelectric power plants are sited at existing dams, which are water infrastructure facilities intended for damming or directing water flow, whereby the energy potential of the watercourse must be checked beforehand.

Large hydroelectric power plants: The following policies are mainly to be taken into account to reduce impacts on the landscape and its development:

- active planning of the edges of impoundment, enabling the preservation of individual landscape features (for instance preservation of parts of the body of water and streams) and re-establishment of substitute landscape features (for instance gravel bars and riparian vegetation);
- designing escarpments by taking into account the surrounding landscape properties of the area and enabling the recreational use of the area along the impoundments;
- sustainable design of riverbeds and the riparian space of tributaries;
- recreational solutions;
- expert architectural design of hydroelectric facilities and their placement in the surrounding landscape and settlements;
- diligent planning of the alignment of accompanying long-distance power lines and the implementation of measures for the restoration of bared escarpments as rapidly as possible, by the use of biological and engineering measures if feasible;

Strategic guidelines for siting solar power plants:

The spatial planning documents should define the (im)permissibility of siting solar power stations by individual spatial planning units or categories of dedicated use of land. As a rule, it should only be permissible to install solar power stations on structures or in a manner (including solar concentrators) that does not present an independent spatial arrangement in the landscape, but rather as part of a comprehensive spatial arrangement (e.g. for an infrastructural or industrial facility, rehabilitation of degraded (brownfield) areas).

The drafting of landscape designs at the lowest levels of planning, which include evaluation of the status and planning of protection and development of landscape recognisability elements is important for directing and a detailed determination of spatial development and protection in individual landscape areas.

The provided general mitigation measures for attaining the goal (17) 'Preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such:** pursuant to the recast methodology within the target research project, exceptional landscape areas and landscape areas with distinctive features, and their number and scope will be determined anew and this will be the subject of the Action Programme for the Implementation of SDSS 2050. - **actual use in exceptional landscape areas and landscape areas with distinctive features:** the selected indicator determines the change in the actual use of space in exceptional landscape areas and landscape areas with distinctive features, which is used to establish the trend of changing exceptional landscape areas and landscape areas with distinctive features. The authors of the Environmental Report have recognised the lack of an indicator for reference status in order to monitor changes of the actual use in exceptional landscape areas and landscape areas with distinctive features, and the lack of a reference status to monitor changes in other landscape areas. As a measure, we propose that their reference status be determined on the basis of the target research project 'Upgrade of the methodology for determining nationally recognised landscape areas' and the upgrade of the Regional Classification of Landscape Types in Slovenia (Marušič, I. 1998. Regionalna razdelitev krajinskih tipov v Sloveniji. Ljubljana, Ministry of the Environment and Spatial Planning, Spatial Planning Office of the Republic of Slovenia) within the Action Programme for the Implementation of SDSS 2050.

2.3 GUIDELINES FOR ENERGY NETWORKS

The siting of a transmission line, cable conduit, or transformer stations in areas of exceptional landscape and landscape areas with distinctive features at a national level causes landscape fragmentation and, as a result, the loss of landscape features, its unique character, identity, and it degrades the landscape image.

The adjustments and the further development of transmission and distribution networks will usually be carried out along existing routes of electrical lines and gaspipes, so that there will be no major impact

on the landscape. The continued expansion of distribution and transmission networks to the regions that have thus far not been covered will have a negative impact, as new routes in open space will be introduced.

We assess that the impact on ensuring the preservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image, taking into account mitigating measures, is insignificant (grade C).

General mitigating measures of the guidelines for developing energy networks for achieving the goal 'Ensuring the preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image':

To ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image, the following guidelines must be pursued:

- in the event of expansion, distribution and transmission networks should not be integrated into exceptional landscape areas or landscapes with distinctive features at the national level;
- Priority planning of networks within existing power line and heating installation corridors.
- Proper technical measures must be applied to provide a high-quality landscape image by pursuing natural and cultural features and the topography of the area, especially in the case of activities in naturally preserved and culturally rich landscape units.

The drafting of landscape designs at the lowest levels of planning, which include evaluation of the status and planning of protection and development of landscape recognisability elements is important for directing and a detailed determination of spatial development and protection in individual landscape areas.

The provided general mitigation measures for attaining the goal (17) 'Preservation of exceptional landscape, landscape areas with distinctive features recognised at the national level, and a high-quality landscape image' must be incorporated in the Draft Spatial Development Strategy of Slovenia 2050 and observed when amending SDSS 2050, which is the responsibility of the SDSS 2050 producer (Ministry of the Environment and Spatial Planning). These measures will be observed particularly when drafting plans (municipal spatial plans, national site plans and detailed municipal site plans), and during project engineering (preliminary design and basic design) and during operation. The implementation of these measures is the responsibility of: client/investor, contractor for spatial documentation and contractor for project documentation. Supervision is conducted by safety departments and the Ministry of the Environment and Spatial Planning during the strategic environmental assessment or the environmental impact assessment and upon the issue of consents or environmental permits for individual plans.

Indicator for status monitoring:

- **presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such:** pursuant to the recast methodology within the target research project, exceptional landscape areas and landscape areas with distinctive features, and their number and scope will be determined anew and this will be the subject of the Action Programme for the Implementation of SDSS 2050.
- **actual use in exceptional landscape areas and landscape areas with distinctive features:** the selected indicator determines the change in the actual use of space in exceptional landscape areas and landscape areas with distinctive features, which is used to establish the trend of changing exceptional landscape areas and landscape areas with distinctive features. The authors of the Environmental Report have recognised the lack of an indicator for reference status in order to monitor changes of the actual use in exceptional landscape areas and landscape areas with distinctive features, and the lack of a reference status to monitor changes in other landscape areas. As a measure, we propose that their reference status be determined on the basis of the target research project 'Upgrade of the methodology for determining nationally recognised landscape areas' and the upgrade of the Regional Classification of Landscape Types in Slovenia (Marušič, I. 1998. Regionalna razdelitev krajinskih tipov v Sloveniji.

Ljubljana, Ministry of the Environment and Spatial Planning, Spatial Planning Office of the Republic of Slovenia) within the Action Programme for the Implementation of SDSS 2050.

2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS

SDSS guidelines foresee the gradual closure of smaller facilities and the rehabilitation of illegal excavation sites, with the priority rehabilitation of excavation sites in areas with landscape recognisability, nature protection areas, or cultural heritage areas, which preserves or improves the quality of the landscape image of the area. The problem regarding existing locations for mining mineral raw materials is reflected in extensive surface changes and visually exposed changes in relief and accompanying facilities, deposit sites, and landfills. Reduced pressure to open new locations for exploiting mineral raw materials for construction needs due to the priority use of recycled construction waste is expected, which reduces the possibilities of having an impact on areas of exceptional landscape and landscape areas with distinctive features and the quality of the landscape image.

We assess that the impact of the guidelines for protecting and supplying mineral raw materials on the landscape is insignificant (grade A).

2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES

The impact of rural development, agriculture and forestry is described in greater detail in the chapter titled '1.3 Guidelines for rural development' within 'Set 1 – Guidelines for attaining objectives of the Spatial Development Strategy of Slovenia (SDSS) 2050 and implementing the spatial development concept – general guidelines for spatial development'.

The total impact of the guidelines for rural development, agriculture, forestry, and fisheries on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and on the high quality of the landscape image has been assessed as insignificant (grade B).

2.6 GUIDELINES FOR NATURE CONSERVATION

These guidelines foresee the preservation of landscape features within the preservation of the habitats of species, which has a positive impact on the environmental objective. The planned establishment of new protected areas, within which recognisable features of the landscape and the landscape image of the area will be consequently protected, also has a positive impact. *We assess that the impact of the guidelines for nature conservation on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and on the high quality of the landscape image is positive (grade A).*

2.7 GUIDELINES FOR TOURISM DEVELOPMENT

The SDSS 2050 guidelines for tourism development refer to the drafting of master plans for tourist macroregions, taking into account guidelines for tourist areas referred to in chapter 1.5.2. The authors of the Environmental Report would like to warn that there is a lack of treating landscape design when drafting tourism master plans in the SDSS 2050. Because the Spatial Planning Act (ZUREP-2) does not foresee the drafting of landscape designs for tourism macro-regions, we propose that SDSS 2050 be amended by adding a guideline that foresees the mandatory coordination of tourism master plans with the spatial planning sector or the coordination of tourism master plans with landscape design guidelines arising from regional spatial plans (RSP) or municipal spatial plans (MSP).

We assess that the impact of the guidelines for tourism development on ensuring the preservation of exceptional landscapes and landscape areas with distinctive features at the national level and a high-quality landscape image is insignificant (grade B).

2.8 GUIDELINES FOR DEFENCE ACTIVITIES

SDSS guidelines foresee the priority development of defence activities in areas that already serve defence purposes; furthermore, the preservation of areas (mostly agricultural or forest areas) of strategic importance for national defence due to their characteristics is also foreseen, which has a positive impact on preserving the integrity of landscape areas and the high-quality landscape image. *The guidelines for defence activities will not have an impact on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and on the high quality of the landscape image is insignificant (grade A).*

2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS

The planning of activities, interventions, and uses outside of endangered areas has a positive impact on preserving the landscape image and the distinctive features of an area. Potential measures for the protection against earthquakes, avalanches, etc. can have a positive impact, which is, however, insignificant taking into account the foreseen guidelines. *We assess that the guidelines for preventive protection against natural and other disasters do not have an impact on ensuring the preservation of exceptional landscape and landscape areas with distinctive features at a national level and on the high quality of the landscape (grade A).*

7.3 CUMULATIVE IMPACTS

Cumulative impacts, as a sum of impacts, each of which are insignificant considering the evaluation criteria, can have impacts that, considering the same evaluation criteria, are no longer insignificant. Because the guidelines for achieving SDSS goals are general, as SDSS is a guidance document and does not discuss specific projects, such cumulative impacts cannot be determined. The synergy impacts of the implementation of the plan are, in total, greater than the sum of individual impacts and are in this sense also not determined.

In this Environmental Report, cumulative environmental impacts are defined as interactive influencing on the environment caused by the implementation of SDSS measures and the implementation of measures within other activities (such as the cumulative impact on the aquatic environment because of the use of water in hydroelectric power plants and the use of water in agricultural production). When the cumulative nature of impacts was being established, programmes adopted at the state level were taken into account, while the cumulative nature of plans and interventions will be assessed at hierarchically lower levels of planning.

Cumulative impacts on the environment are defined in this Environmental Report as the sum of the impacts of the implementation of SDSS measures on various aspects on the environment/environmental objectives and the sum of the impacts on the environment caused by the implementation of the objectives together with the implementation of other programme documents of the Republic of Slovenia.

The programming documents listed below were drafted so that they are in accordance with the existing legally valid documents or legal acts, and mutually harmonised. When significant environmental impacts may be expected during their implementation, they will be evaluated separately in the comprehensive environmental impact assessment procedure. The total cumulative impacts of implementing the strategic documents enumerated below are assessed as positive. Negative impacts may be expressed in subsequent planning or implementation phases.

- Water Management Plan for the Danube River Basin for the 2016–2021 Period, Water Management Plan for the Adriatic Sea Water Area for the 2016–2021 Period (October 2016) in Marine Environment Management Plan 2017–2021 (May 2017),
- Operational programme for complying with national emission ceilings for atmospheric pollutants (amendments are being prepared),
- Operational programme for the protection of ambient air against pollution caused by PM₁₀
- Operational programme for limiting greenhouse gas emissions (amendments in preparation),
- Resolution on the National Forest Programme
- Natura 2000 Management Programme for the Period 2015–2020,
- Resolution on National Environmental Action Plan,
- Resolution on the National Culture Programme for 2018–2025 (in preparation),
- Cultural Heritage Strategy 2020–2023,
- Resolution on the strategic guidelines on the development of Slovenian agriculture and the food industry by 2022,
- The Strategy for the Preservation of Biodiversity in Slovenia (Strategija ohranjanja biotske raznovrstnosti v Sloveniji),
- Transport Development Strategy in the Republic of Slovenia.

7.4 CROSS-BORDER EFFECTS

The guidelines for achieving SDSS goals are general, as the Spatial Development Strategy of Slovenia is a guidance document that does not dictate the physical siting of structures into space, but merely shows the development of space in the future. SDSS refers to, takes into consideration, and adopts spatial planning goals and principles arising from the documents, guidelines, and recommendations by United Nations bodies, the Council of Europe, and the European Union, so no major cross-border impacts are expected, as they are defined in current legislative documents. The procedure of cross-border environmental impact assessment must be carried out in further phases of drafting project

8. ALTERNATIVES

documentation for plans that could significantly impact the environment in neighbouring countries.

Within the renewal of the Spatial Development Strategy of Slovenia from 2004 (SDSS 2004), the spatial development model for Slovenia 2050 was developed (Faculty of Biotechnology, November 2017) as the basis for drafting SDSS 2050. On the basis of the vision and the goals of spatial development 2050, development projections, and the premises in key strategic documents, two versions of the spatial development model, A and B, were first drafted. The proposed models served as the basis for a broader discussion, the findings of which were summarised in the proposal for model C,

which became the premise and framework for SDSS 2050. The model versions A and B can be considered as the alternatives to the spatial development foreseen in SDSS 2050.

Model A is a model of concentrated polycentric spatial development based on three centres of international importance, four centres of national importance, and five centres of regional importance. The smaller number of centres means that the population and services are more concentrated in high-rank centres, which enables a more rational organisation of public transport (sustainable mobility) and other services, mainly within wider urban areas.

Model B is a model of deconcentrated polycentric spatial development with a larger number of centres: in addition to the three centres of international importance, it has nine centres of national importance and ten centres of regional importance. The larger number of centres requires good transport connections between individual centres and good interregional connections in public transport. Due to the smaller number of users, there are more problems in effectively providing services, particularly public passenger transport services.

Both advantages and disadvantages have been found for both models in terms of spatial development goals and challenges as well as from the perspective of environmental objectives. Model A has more advantages arising from concentration (cost efficiency, greater effectiveness and quality of services that require critical mass) and is thus slightly better from the perspective of rational spatial development and the competitiveness of towns and cities, it enables a better response to globalisation challenges, and enhances the role of towns and cities in international integration. The greater concentration of population and services in high-rank centres enable a more rational organisation of transport and infrastructure, which reduces the chances of affecting open space and the natural environment. On the other hand, this is a deviation from the even development of the countryside, which provided the spatial identity and the quality of life in these areas, and provides fewer solutions for smaller centres and remote areas; it also has more disadvantages in terms of climate change. The advantages of model B mainly stem from the aspect of rationality and the quality of the everyday life of individuals and the preservation of the existing network, enhancing bottom-up functioning, and preserving the identity of small centres. In addition to the problems from the perspective of ensuring critical mass for the rational and high-quality performance of services, the negative result of dispersion are also landscape fragmentation due to a larger number of (minor) regimes and the negative impact on identity. The dispersion of centres also results in a more complex organisation of interconnections and infrastructure, which increases pressures on open space and the natural environment. The difference in the rank and number of centres therefore results in differences in the distribution, quality, accessibility of services, the method of their assurance, required funds, space, natural resources, impacts on traffic flows and linked consequences as well as impacts on the natural environment.

8.1 STATUS DEVELOPMENT WITHOUT IMPLEMENTING SDSS 2050 MEASURES

If the Spatial Development Strategy of Slovenia 2050 is not adopted, the future spatial development of the country will be based on a spatial development strategy that was adopted by way of the Ordinance on the Spatial Planning Strategy of Slovenia (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 76/04). Status development in space without implementing SDSS 2050 guidelines is presented below by individual areas of the environment.

8.1.1 NATURAL RESOURCES: LAND AND FOREST

There is a visible increase in built-up land in Slovenia as a result of the expansion of settlement areas and the increased demand for land, including forest land, due to some sectoral development programmes. This spatial development trend is completely unacceptable. Land is a very important non-renewable natural resource that performs many functions and tasks that are significant for human activities and the survival of the ecosystem. Land is a source of biodiversity, the basis for most human activities, storage for carbon, and finally an archive of geological and archaeological heritage; it also significantly impacts other environmental protection aspects, such as protecting surface waters and groundwater, human health, climate change, the protection of nature and biodiversity, and food safety.

Without the consistent implementation of SDSS 2050 guidelines, the preservation of all land functions is not ensured, which indirectly also means that the preservation of all forest functions is not ensured, although the pressure on the preservation and resilience of forests is objectively smaller. SDSS 2050 guidelines prevent land use to be carried out in a way that does not ensure sustainable development, i.e. in a manner that fails to maintain the ability of land and forest to perform all ecosystem functions and prevents future generations from being able to meet their needs. SDSS 2050 guidelines are based on measures for preserving land functions, measures for preventing land degradation and for mitigating land degradation impacts, and measures for rehabilitating already degraded land; as a result, they are also based on measures for reducing the preservation and resilience of forests.

Without taking into account SDSS 2050 guidelines, further land development will not be limited and the renovation of abandoned areas or concentrating the population in current settlement areas will not replace the need for new land development.

8.1.2 AIR

Pursuant to the air quality policy in the European Union, a better connection between controlling sources of pollution, emission ceilings, and ambient air quality standards should be established, which means that the coordination between the measures from the Directive on national emission ceilings (NEC Directive) and the action plans arising from Directive 2008/50/EC on ambient air quality should be improved. The better coordination of the measures from both directives mainly dictates the effective actions for reducing NO_x emissions from road traffic and the reduction of emissions of pollutants from combustion plants, which will significantly contribute to reducing the local pollution of ambient air. SDSS 2050 guidelines significantly contribute to the successful coordination of the measures from both of the said directives. Without taking into consideration SDSS 2050 guidelines, achieving the reduction in local air pollution would be more difficult, and the deadlines for achieving the goals from both of the said directives would be extended.

8.1.3 WATER

In urban areas, SDSS 2050 guidelines that refer to the development of settlement in Slovenia significantly contribute to reducing the pressure *on the ecological and chemical status of surface water, the quantity and chemical status of groundwater, and the status of the maritime environment*. For the purpose of achieving all of the territorial cohesion goals in Slovenia, SDSS 2050 also provides guidelines for the further development of *transport infrastructure* and the further development of *energy infrastructure to support a transition to a low-carbon society*. When siting facilities of these two infrastructure types, one should be careful because siting such infrastructure into the environment also poses a risk to achieving a good status of surface water and groundwater and the good status of the maritime environment.

Without SDSS 2050 guidelines, achieving the goals of *preventing the deterioration of the status of surface water and achieving the good ecological status/potential and the good chemical status of surface water, the good quantity and chemical status of groundwater, and the good status of the*

maritime environment would be more difficult. The mitigating measures that need to be taken when siting transport and energy infrastructure would be left to random decision-making and would be ineffective because they would not be directed by the sustainably-oriented spatial development policy for Slovenia, i.e. the policy expressed in SDSS 2050, which includes the goals of *economic, social, and territorial cohesion* that have been integrated in a balanced manner, taking into account all of the agreed upon environmental, climate, and energy objectives of the European Union.

8.1.4 NATURE

The spatial development strategy adopted by way of the Ordinance on the Spatial Planning Strategy of Slovenia (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 76/04) took into consideration the requirements for ensuring and protecting the quality of the environment. Nature conservation, the protection of spatial identity and cultural heritage, and protecting and enhancing the quality of the living and working environment were fundamental development requirements included by the adopted spatial development strategy as an integral part of providing guidance for spatial development. Within nature conservation, the goals of spatial development were the promotion of the preservation of biodiversity, valuable natural features, and natural processes as key elements in the high-quality natural environment, providing a suitable inclusion of biodiversity and valuable natural features into the management of natural resources and space, and establishing a network of special protection areas and protected areas. The existing spatial development strategy did suitably guide development and take into consideration nature conservation goals, but the new strategy also takes into account the changes in nature conservation that have occurred in this field after 2004. Without adopting the new strategy, the spatial development goals would, after some time, no longer reflect the actual condition in space. The pressure on the environment and, as a result, also on protected areas would increase in time.

8.1.5 CLIMATE CHANGE

In order to achieve the goal of the climate-energy legislative framework by 2030, Slovenia will adopt a national climate and energy plan, within which the measures for achieving the national proportion of renewable energy in the final consumption of energy will also be defined (the proportion is currently not determined, but it is not expected for it to be less than 32%). On the basis of SDSS 2050 guidelines, the dilemma regarding the dominance of one public benefit over other public benefits will have to be resolved as the national plan is adopted, namely the dominance of the public benefit of producing electricity in hydroelectric power plants and wind farms over the public benefits of achieving a good status of water and nature preservation. Without SDSS 2050 guidelines, this coordination of public benefits for the purpose of achieving balanced sustainable development would be more difficult.

SDSS 2050 guidelines also clearly define the key role of towns, cities, and local communities in the implementation of the measures for promoting the use of alternative energy and low-emission vehicles, active mobility (cycling and walking), public transport, and bike- and car-sharing and car-pooling to reduce congestion and ambient air pollution. Without SDSS 2050 guidelines, these measures for ensuring sustainable mobility would be very limited or at least delayed.

However, the most important SDSS 2050 approaches are the ones that are based on establishing green infrastructure. These approaches are deemed most widely applicable, economically viable and effective tools to combat the impacts of climate change, because they use biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to or mitigate the adverse effects of climate change.

Establishing green infrastructure, as foreseen by SDSS 2050 guidelines, is also a way to achieve lower carbon footprint from the transport and energy sectors, as it mitigates the negative effects of land uptake and fragmentation, and boosts opportunities to better integrate land use, ecosystem, and biodiversity concerns into the planning of the transport and energy sectors. According to SDSS 2050, the solutions with green infrastructure are a crucial part of the policy for managing risks due to natural disasters, such as floods, landslides and avalanches, forest fires, and storms. Without SDSS 2050 guidelines, the solutions with green infrastructure would not play such an important role in planning spatial development.

8.1.6 HUMAN HEALTH

8.1.6.1 Drinking water

It is evident from publicly accessible reports that drinking water in Slovenia is wholesome, and the WEI indicator for Slovenia also shows that, despite the impacts of the expected climate change, the risk that the availability of water for ensuring sufficient quantities of wholesome water would reduce significantly is not high. Regardless of this relatively favourable prognosis given for Slovenia by the WEI indicator, it should be noted that the drinking water in Slovenia mainly comes from groundwater, which means that groundwater recharge in shallow aquifers and the protection of these aquifers from pollution are more important for the reliable supply with drinking water.

SDSS 2050 guidelines with green infrastructure solutions provide cost efficient possibilities for the better implementation of Directive 98/83/EC on drinking water and Directive 2006/118/EC on groundwater. Green infrastructure solutions are particularly important in urban environments. The characteristics of green infrastructure in towns and cities bring health benefits that are not just clean air and shelter from a heat wave, but also better water quality used for supplying the population with drinking water. Without implementing SDSS 2050 guidelines, the supply of the population with wholesome drinking water in sufficient quantities would be at risk.

8.1.6.2 Air quality

In some areas of Slovenia, the quality of life has been excessively impaired in some areas of Slovenia due to the exposure to polluted air, as ambient air quality standards related to the concentration of particles and the concentration of ozone in the air have not yet been met. The situation related to the excessive ambient air pollution with particles is especially grave in the areas of some urban municipalities and basins during winter due to low wind speeds and the more common use of technologically unsuitable biomass heating systems.

The SDSS 2050 guidelines for planning and developing settlements suitably define the set of measures to be taken to solve urban challenges related to reducing ambient air pollution, whereby the most important guidelines are the ones related to the introduction of sustainable mobility and the priority planning of district heating and cooling systems using renewable and CO₂-neutral energy sources. Without taking into account SDSS 2050 guidelines, the effectiveness of the measures for reducing the pollution of ambient air in some mainly urban areas of Slovenia would be significantly reduced.

8.1.6.3 Noise pollution

The main political objective of the 7th EU Environment Action Programme is to significantly reduce noise pollution by 2020 and come close to the noise levels recommended by the World Health Organisation. SDSS 2050 indirectly comes close to environmental protection measures for noise protection by providing general guidelines for transport infrastructure development dictating that noise

emissions be reduced by updating the vehicle fleet, road and rail infrastructure, and taking additional measures to reduce the burden on the environment due to noise.

Guidelines that indirectly influence the redirection of traffic flows on long-distance transit transport corridors (to the railway network as a priority) and in the urban environment (public transport) are also important. All general SDSS 2050 transport infrastructure development guidelines have a positive impact on reducing noise pollution by road and rail transport.

In order to reduce the exposure of people to excess noise, other measures are also required, such as preserving what is known as quiet areas in towns, cities, and in open space. The role of green infrastructure emphasised in SDSS 2050 offers cost efficient possibilities for the better implementation of Directive 2002/49/EC on environmental noise, because green infrastructure solutions are significant for preventing the noise transmission caused by road traffic or rail transport in urban areas. Without SDSS 2050 guidelines, the implementation of the measures for coming close to the recommended noise levels, particularly near transport infrastructure, would slow down.

8.1.6.4 Electromagnetic radiation and light pollution

SDSS 2050 guidelines address the impacts on human health from the perspective of burdening the environment through electromagnetic radiation and light pollution only indirectly, through the guidelines for raising the level of the quality of life in settlements. These guidelines predict that the access of people to services of general interest and general economic interest will improve. However, for the improvement of the access to these services to improve, urban areas must be better equipped with networks, which are the source of electromagnetic radiation and light pollution (electric power grids, transport and telecommunication networks).

Taking into account all of the prescribed standards and encouraging the use of the already established technical solutions in the field of reducing the impacts of electromagnetic radiation and light pollution, it is to be expected that SDSS 2050 guidelines will contribute to reducing and preventing adverse effects on human health from the perspective of burdening the environment through electromagnetic radiation and light pollution.

On the basis of SDSS 2050, the expected greater density of the networks that are the source of electromagnetic radiation and light pollution in settlements should not pose a risk to reducing or preventing adverse effects on human health, provided that the prescribed standards and the application of new technical solutions for reducing the impacts caused by these sources are consistently taken into consideration.

8.1.7 POPULATION AND MATERIAL ASSETS

The goal of territorial cohesion is providing optimum distribution of activities and services in space, which enables the best possible use of the natural features of individual areas and the integration of policies for achieving economic efficiency, social cohesion, and ecological balance, taking into consideration the principles of sustainable development, which is of key importance in developing these policies.

SDSS 2050 guidelines introduce measures for achieving territorial cohesion goals in the territory of Slovenia. Without SDSS 2050 guidelines, spatial development in the territory of Slovenia and the sustainable development that enables a more even and more sustainable use of resources, including natural resources, such as drinking water, renewable energy sources, or areas with rich biodiversity, and similar, would not be balanced.

SDSS 2050 guidelines also address the activities for ensuring that the flood risk level stays low or that flood risk is reduced. Guidelines related to green infrastructure, which ensures the multi-functionality of space at a regional level, particularly its ecological and environmental functions and the compatible use of space, are especially important. With regard to flood risk, the role of green infrastructure is particularly important for the purpose of preserving floodplains. Without SDSS guidelines, the activities for managing flood risk in Slovenia would be less effective.

8.1.8 CULTURAL HERITAGE

The goals of the spatial development of Slovenia from the existing spatial development strategy from 2004 try to encourage the preservation and development of cultural diversity as a basis for the high-quality national spatial recognisability, high-quality living environment, and social inclusion, and to provide access to heritage and, as a result, increase identification, educational, and economic potentials and the sustainable use of heritage. There are very few guidelines for preserving cultural heritage within further development in the existing spatial development strategy and they are rather general; nevertheless, the strategy suitably directs development, taking into account protection goals. On the other hand, the new strategy and its guidelines more comprehensively addresses cultural heritage areas within the scope of enhancing spatial identity, their preservation and renewal, and takes into consideration changes in the cultural heritage protection that has been performed in this area in the last fifteen years. Without adopting a new strategy, the pressure caused by further development on cultural heritage units and their areas of influence would gradually increase, which would lead to the permanent loss of individual cultural heritage units and areas or their features.

8.1.9 LANDSCAPE

In 2004, the Spatial Development Strategy of Slovenia introduced the term ‘landscape recognisability’ in Slovenia and defined and determined recognisable landscape areas at a national level, which then served as the basis for further planning and developing protection measures. It provided the fundamental development requirements as an integral part of directing future spatial development, which are based on preserving Slovenia's recognisability from the perspective of the cultural and symbolic significance of the landscape and on preserving the natural features of the landscape. Therefore, the existing spatial development strategy provided the basis for developing, protecting, and managing the landscape, but the guidelines are too general and the concept of recognisability is not supported by instruments. The new strategy defines landscape recognisability areas as an integral part of green infrastructure, which also consists of Natura 2000 networks, protected areas, valuable natural features, green areas in urban settlements, and other land relevant for the ecological cohesion of these areas. The new Strategy only provides general guidelines as a part of the guidelines for preserving and improving the recognisability of settlements and the landscape, newly determined and evaluated areas of exceptional landscape, landscape areas with distinctive features, and activities defined in greater detail; operators, deadlines, and funds will be a part of the Action Programme 2020–2030. Without adopting a new strategy, the trend of changing the Slovenian landscape in the sense of degrading areas and losing recognisable and harmonious landscape structures would continue.

9. MONITORING

Environmental indicators for monitoring the environmental impact of SDSS 2050 were proposed on the basis of the results of the environmental assessment. Indicators that are measurable and whose state is already being monitored in Slovenia are proposed as priorities. These are indicators the results of which are systematically collected, processed and reported at the state level. When selecting indicators, indicators were used which are already being used to measure the state of the environment in Slovenia as part of the EIONET-SI network, which was emphasised due to Slovenia's obligation to report to the European Environment Agency, and those that are kept by the Statistical Office of the Republic of Slovenia (SURS) in its records. If an indicator is already being monitored, its official sequence number is recorded next to it.

Furthermore, environmental indicators were also sought among the data collected by individual ministries, organisations, and institutions. These indicators do not have sequence numbers.

The environmental indicators are verified by the SDSS 2050 producer – the Ministry of the Environment and Spatial Planning. The data on the status of the environmental indicators is verified after the year 2020 ends and then periodically every five years.

The table below shows the connection between the selected environmental objectives and the environmental indicators proposed to monitor the situation.

Table 8: Environmental indicators for monitoring the SDSS 2050

Environmental objective	Proposed environmental indicators
Environmental objective 1: Ensure sustainable management of soil and forests	<ul style="list-style-type: none"> -Surface area and the proportion of artificial land area -surface area and the proportion of agricultural land area -Waste management [OD07]
Environmental objective 2: Ensure the realisation of long-term goals for annual air pollutant emission amounts	-Projections of air pollutant emissions [ZR14]
Environmental objective 3: Prevent deterioration in the status of surface waters and ensure the attainment of good ecological status/potential and good chemical status of surface waters	-Ecological and chemical status of surface waters [VD12]
Environmental objective 4: Preserve or ensure good quantitative and chemical status of groundwater	<ul style="list-style-type: none"> -Quantitative groundwater recharge [VD15] -Groundwater quality [VD11]
Environmental objective 5: Ensure good status of the marine environment	The indicators listed in Chapter X of the 2017–2021 Marine Environment Management Plan are determined as ‘Indicators for monitoring the effectiveness of implementing the plan’s programme for measures’.
Environmental objective 6: Protect and preserve biodiversity	-Change of the conservation status of species and habitat types from the report as per Article 17 of the Habitats Directive (92/43/EEC)
Environmental objective 7: Preserve the integrity of areas with a nature protection status by preserving the characteristics and processes due to which they are protected	<ul style="list-style-type: none"> -Change of the conservation status of species in the SPA areas and on the territory of the whole Slovenia from the report as per Article 12 of the Directive on the conservation of wild birds (79/409/EEC) - spatial data (digital layer) for areas with a nature protection status.
Environmental objective 8: Reduce greenhouse gas emissions	-Greenhouse gas emissions [PS03]
Environmental objective 9: Reduce the vulnerability of infrastructure and settlements to climate change	-Estimated damage caused by natural disasters [PS01]
Environmental objective 10: Provide people with a safe supply of wholesome drinking water in sufficient quantities	<ul style="list-style-type: none"> -Access to drinking water [ZD05] -Quality of drinking water [VD08] - Indicator of unsuitable protection of a drinking water source: number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Waters Act.
Environmental objective 11: Reducing the exposure of people to polluted air	<ul style="list-style-type: none"> -Air quality [ZR11] -Air pollution with PM10 and PM2.5 particulates [ZR08] -Air pollution by ozone [ZR07]
Environmental objective 12: Reduce the exposure of people to excessive noise levels	-Exposure of people to noise due to transport and the exposure of people to noise in agglomerations (Ljubljana and Maribor) due to the noise from road and rail transport and important industrial facilities and devices [PR18]
Environmental objective 13: Prevent adverse effects on human health from the perspective of EMR and light pollution	- Annual electricity consumption of all lights that are built in the lighting of public surfaces in the territory of an individual settlement calculated per capita

Environmental objective 14: Ensure optimum distribution of activities in space	-Human development index [SE03] -Development and distribution of tourism [TU01] -Gross domestic product [SE01]
Environmental objective 15: Ensure good status of the marine environment and ensure the preservation of a low flood risk or reduce flood risk	-Proportion of resident population living in a flood plain [ZD24]
Environmental objective 16: Ensure comprehensive cultural heritage preservation	-Status of areas and structures of cultural heritage
Environmental objective 17: Ensure the conservation of exceptional landscapes and landscape areas with distinctive features at the national level, and a quality landscape image	- presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such. - actual use in areas of exceptional landscape and landscape with distinctive features.

9.1 NATURAL RESOURCES: LAND AND FOREST

Indicator: Surface area and the proportion of artificial land area, separately for developed and undeveloped artificial land – indicators of the land use and land cover survey (LUCAS) for the area of Slovenia

The data on land use and land cover LUCAS is monitored at the level of the European Union and is provided by the Statistical Office of the European Communities (Eurostat). Data is collected every three years. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Surface area and the proportion of forest area – indicators of the land use and land cover survey (LUCAS) for the area of Slovenia

The data on land use and land cover LUCAS is monitored at the level of the European Union and is provided by the Statistical Office of the European Communities (Eurostat). Data is collected every three years. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Waste management [OD07]

The indicator shows the amount of generated waste in Slovenia and the ratio between recovered waste and deposited waste according to individual year. Waste management is monitored by the Slovenian Environment Agency, data is collected annually. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

9.2 AIR

Indicator: Projections of air pollutant emissions [ZR14]

The indicator shows data regarding the actual emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), ammonia (NH₃), and dust particles (PM_{2.5}) and the projections for these pollutants. The database of the state monitoring of ambient air quality is used to monitor the status, and the data is provided by the Slovenian Environment Agency. Data are collected in accordance with annual monitoring programmes of ambient air quality (control and operational monitoring), while the assessment of excessive ambient air pollution is carried out after each calendar year. Considering the implemented SDSS 2050 guidelines, the data on the status of

an indicator needs is verified by the SDSS 2050 producer after the year 2020 ends and then periodically every five years.

9.3 WATER

Indicator: Ecological and chemical status of surface waters [VD12]

The indicator is an assessment of the chemical and ecological status of surface water and is given in accordance with the criteria of the Framework Water Directive (2000/60/EC). The ecological and chemical status of surface waters is monitored by the Slovenian Environment Agency, the data is collected in accordance with annual surface water status monitoring programmes (supervisory and operational monitoring), and the evaluation of the chemical and ecological status is carried out once during the period of the water management plan (a six-year period). The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Groundwater quality [VD11]

The indicator provides an evaluation of the chemical state of groundwater in Slovenia. The quality of groundwater is monitored by the Slovenian Environment Agency and data is collected through the supervisory and operational monitoring of groundwater quality. The supervisory monitoring of the status is carried out in all water bodies, but only once during the period for implementing the water management plan. The operational monitoring of the status is carried out constantly, but only in the water bodies for which it is likely that they will not achieve the set quality-related goals, in the water bodies that are significant for the water supply of a larger number of people, and in the water bodies in which, considering the land use, major groundwater pollution could occur. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: The indicators listed in Chapter X of the 2017–2021 Marine Environment Management Plan are determined as ‘Indicators for monitoring the effectiveness of implementing the plan’s programme for measures’.

The status of indicators is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of indicators needs to be verified after the year 2020 ends and then periodically every five years.

9.4 NATURE

Three indicators show the status of natural environment and biodiversity:

- **Indicator: Change of the conservation status of species and habitat types** from the report as per Article 17 of the Habitats Directive (92/43/EEC);
- **Indicator: Change of the conservation status of species in the SPA areas and on the territory of the whole Slovenia** from the report as per Article 12 of the Directive on the conservation of wild birds (79/409/EEC);
- **Indicator: spatial data (digital layer) for areas with a nature protection status.**

The status of species and habitat types should be checked on the basis of a report prepared on the basis of Article 17 of the Habitats Directive (92/43/EEC) and a report prepared on the basis of Article 12 of the Conservation of Wild Birds Directive (79/409/EEC). The Member States are required to prepare a report on the basis of Article 17 of the Habitats Directive every six years, and a report on the basis of Article 12 of the Conservation of Wild Birds Directive every three years. The status of indicators is

monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of indicators needs to be verified after the year 2020 ends and then periodically every five years.

9.5 CLIMATE FACTORS

Indicator: Greenhouse gas emissions [PS03]

The indicator shows the movement of greenhouse gas emissions in Slovenia, the main sources of emissions (according to category and industry) and a comparison with the European Union member states (EU-28). The source database or the source for designing the indicators was the record of greenhouse gas emissions, GHG archives, Slovenian Environment Agency. The administrator of the data is the Slovenian Environment Agency. The data on greenhouse gas emissions is refreshed annually. The latest data refer to the last two-year period and became available in April of the current year. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Estimated damage caused by natural disasters [PS01]

The indicator shows the estimation of damage caused by natural disasters that are made by the competent national commission or municipal commissions through direct inspection of means and goods in private and other ownership that were affected by any form of natural-disaster-related damage. The source database or the source for developing the indicator is the data published on the SI-STAT data portal of the Statistical Office of the Republic of Slovenia. The data on the material damage estimate recorded by committees for evaluating damage are shown by municipalities for each natural disaster separately. Due to incomplete reporting and methodological issues, the data is not complete. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

9.6 HUMAN HEALTH

Indicator: Access to drinking water [ZD05]

The indicator shows the number of people and their proportion in Slovenia's population supplied with drinking water in the water supply areas that have been included in the monitoring of drinking water in the 2004–2017 period as well as the proportion of people who were not part of the monitoring of drinking water. For the needs of the indicator, the data from annual reports on drinking water published by the National Institute of Public Health has been summarised. The database on systems for supplying drinking water and on the conformity of drinking water is refreshed and updated for each separate calendar year on an ongoing basis, using the test results for samples collected within the state monitoring system in the same year. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Quality of drinking water [VD08]

The indicator shows the proportion of non-conforming drinking water samples due to microbiological and chemical contamination according to the size classes of water supply areas and, in the event of microbiological contamination, also according to statistical regions. The quality of drinking water is monitored by the Slovenian Environment Agency. The data on systems for drinking water supply and on water supply areas are to be updated once a year, the data on drinking water quality is entered into the database on an ongoing basis and shown as the annual Database on Systems for Drinking Water Supply and Drinking Water Conformity. The status of an indicator is monitored by the SDSS 2050

producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator of unsuitable protection of a drinking water source The number and percentage of water protection areas where the protection of a drinking water source is not governed by a regulation issued on the basis of the Waters Act. The status of the indicator is prepared by the SDSS 2050 producer on the basis of the data provided by the office of the Ministry of the Environment and Spatial Planning competent for drafting the regulations concerning the regime for protecting the drinking water source; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Air quality [ZR11]

The indicator shows excessive limit values of sulphur dioxide (SO₂), particles (PM₁₀), ozone (O₃), and nitrogen dioxide (NO₂). The data is taken from the database on automatic measurements of the state-run ecological and meteorological network for ambient air quality monitoring of the Slovenian Environment Agency. The updating of the database at the Slovenian Environment Agency is carried out on a monthly basis, and data is finally available to the public after an annual review is performed. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Air pollution with PM₁₀ and PM_{2.5} particulates [ZR08]

The State-Run Network for Air Quality Monitoring (DMKZ) is managed by the Slovenian Environment Agency. The updating of the database on ambient air quality is carried out on a monthly basis, and data for the current year is finally available only after an annual review is performed. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Air pollution by ozone [ZR07]

This indicator shows the number of days with exceeded ozone target value and the number of hours with exceeded information value within a calendar year. Air pollution by ozone is monitored by the Slovenian Environment Agency. The updating of the database on ambient air quality is carried out on a monthly basis, and data is finally available the data for the past year has been reviewed. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Exposure to noise from transport [PR18]

The indicator shows noise exposure along important roads and railway lines, and separately, noise exposure in areas of settlements (Ljubljana and Maribor) from road and rail transport, and important industrial facilities and devices. The source database or the source are strategic noise maps for major roads, railways, the Urban Municipality of Ljubljana, and the area of Maribor. Strategic noise maps must be drafted every five years. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

9.7 POPULATION AND MATERIAL ASSETS

Indicator: Annual electricity consumption of all lights that are built in the lighting of public surfaces in the territory of an individual settlement calculated per capita

The indicator shows the annual electricity consumption of all lights that are built in the lighting of public surfaces in the territory of an individual settlement calculated per capita; whereby electricity consumption for LED bulbs and gas discharge lamps is determined and assessed separately. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Human development index [SE03]

The indicator shows the human development index, which is an important indicator of the complexity of the relationship between income and well-being as well as the interwovenness and interconnectedness of economic and social policies. The data administrator are the United Nations – the United Nations Development Programme (UNDP) calculates the human development index every year. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Development and distribution of tourism [TU01]

The indicator shows tourism development in Slovenia through the trend of the number of available beds and the number of overnight stays as well as their time distribution according to the type of tourist destination. The data administrator is the Statistical Office of the Republic of Slovenia and the data source is the SI-STAT database. Data on the capacities of tourist accommodation facilities (number of rooms and beds) and on tourist arrivals and overnight stays is reported monthly to the Statistical Office of the Republic of Slovenia by companies and other organisations providing accommodation to tourists or providing such services as that of an agency, as well as individuals who rent private rooms. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Gross domestic product [SE01]

The indicator shows the gross domestic product per capita according to purchasing power in Slovenia and EU-27 countries in the 1995–2008 period. The data administrator is EUROSTAT, which publishes annual data on GDP according to purchase power parity. The results refer to 36 countries, the comparison of which is managed and coordinated by Eurostat. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

Indicator: Proportion of resident population living in a flood plain [ZD24]

The indicator shows the proportion of people living in a flood plain. The data administrator is the Institute for Water of the Republic of Slovenia, the data source is the Report on Determining Areas of Important Impacts of Floods in the Republic of Slovenia and Monitoring the Activities of Flood Risk Management in Areas of Important Impacts of Floods (Ministry of Agriculture and the Environment, 2013). The data on the proportion of people living in flood plains, including determining flood areas, is updated every five years. The data on implementing flood risk reduction activities in the 61 areas with a significant impact of floods in the Republic of Slovenia is reported to the Government of the Republic of Slovenia every 12 months. The status of an indicator is monitored by the SDSS 2050 producer; considering the implemented SDSS 2050 guidelines, the status of an indicator needs to be verified after the year 2020 ends and then periodically every five years.

9.8 CULTURAL HERITAGE

Indicator: status of areas and structures of cultural heritage

In addition to quantitative data about the areas and structures of cultural heritage, the indicator also consists of an expert opinion. The Ministry of Culture is also involved in drafting an expert opinion with data interpretation. The said indicator is used until the new indicator 'Endangerment of cultural

heritage' is introduced, which is still being prepared and will be made on the basis of the data on the risk to individual types or units of heritage. The status of the indicator must be verified every five years with regard to the SDSS 2050 guidelines implemented. Monitoring with regard to the implementation of individual SDSS 2050 guidelines should be determined within the framework of a detailed spatial planning procedure.

9.9 REGION

The indicators for monitoring the status of landscape are as follows:

- **Indicator: presence of exceptional landscape areas and landscape areas with distinctive features, including their valuable characteristics on the basis of which they are defined as such.**
- **Indicator: actual use in areas of exceptional landscape and landscape with distinctive features.**

The indicators show areas of exceptional landscape and landscape areas with distinctive features, including their valuable features due to which they have been defined as such, and the change in the actual use of space in exceptional landscape areas and landscape areas with distinctive features, which is used to establish the trend of changing exceptional landscape areas and landscape areas with distinctive features. The authors of the Environmental Report have recognised the lack of an indicator for reference status in order to monitor changes of the actual use in exceptional landscape areas and landscape areas with distinctive features, and the lack of a reference status to monitor changes in other landscape areas. Their baseline condition will be determined on the basis of the results of the target research project 'Upgrade of the methodology for determining nationally recognised landscape areas' and the upgrade of the Regional Classification of Landscape Types in Slovenia (Marušič, I. 1998. Regionalna razdelitev krajinskih tipov v Sloveniji). Ljubljana, Ministry of the Environment and Spatial Planning, Spatial Planning Office of the Republic of Slovenia) within the Action Programme for the Implementation of SDSS 2050. Pursuant to the recast methodology within the target research project, exceptional landscape areas and landscape areas with distinctive features, their number and scope, and their baseline condition will be determined anew.

The SDSS 2050 producer should monitor the status of the indicators in cooperation with the competent landscape development and protection services. Such monitoring could form part of the regular monitoring of the status of landscape at a national level. The status of the indicators must be verified every five years with regard to the SDSS 2050 guidelines implemented. The monitoring of the status should be carried out by qualified experts from the field of landscape protection. Monitoring with regard to the implementation of individual SDSS guidelines should be determined within the framework of a detailed spatial planning procedure.

10. CONCLUSION OF THE COMPREHENSIVE ENVIRONMENTAL IMPACT ASSESSMENT

The table below provides the assessments of the results of implementing SDSS 2050 guidelines on the realisation of the environmental objectives. The table has been made on the basis of evaluating the impacts of implementing SDSS 2050 guidelines on the environmental objectives, according to individual aspects of the environment for each guideline group within both sets of SDSS 2050 guidelines, the environmental impacts of which have been assessed in this Environmental Report.

Table 22: Compliance with the environmental objectives by individual groups of guidelines for achieving the goals of the SDSS 2050

SDSS 2050 guidelines/enviro nmental objectives	Land and forest	Air	Water			Nature		Climate factors		Human health				Population and material assets		Cultural heritage	Landscap e
	EO 1	EO 2	EO3	EO 4	EO 5	EO 6	EO 7	EO 8	EO 9	EO 10	EO 11	EO 12	EO 13	EO 14	EO 15	EO 16	EO 17
1st set of guidelines – general guidelines for spatial development																	
1.1 guidelines for planning and developing settlements																	
1.2 GUIDELINES FOR URBAN DEVELOPMENT																	
1.3 GUIDELINES FOR RURAL DEVELOPMENT																	
1.4 GUIDELINES FOR DEVELOPING GREEN INFRASTRUCTURE																	
1.5 GUIDELINES FOR SPECIAL AREAS AND APPLICATIONS																	
2nd set of guidelines – guidelines for developing public policies:																	
2.1 GUIDELINES FOR DEVELOPING TRANSPORT INFRASTRUCTURE																	
2.2 GUIDELINES FOR DEVELOPING ENERGY INFRASTRUCTURE																	
2.3 GUIDELINES FOR ENERGY NETWORKS																	
2.4 GUIDELINES FOR PROTECTING AND SUPPLYING MINERAL RAW MATERIALS																	
2.5 GUIDELINES FOR RURAL DEVELOPMENT, AGRICULTURE, FORESTRY AND FISHERIES																	
2.6 GUIDELINES FOR NATURE CONSERVATION																	
2.7 GUIDELINES FOR TOURISM DEVELOPMENT																	
2.8 GUIDELINES FOR DEFENCE ACTIVITIES																	
2.9 GUIDELINES FOR PREVENTIVE PROTECTION AGAINST NATURAL AND OTHER DISASTERS																	

Key: **A** no impact or the impact is positive, **B** the impact is insignificant, **C** the impact is insignificant due to the implementation of mitigating measures, **D** the impact is significant, **E** the impact is destructive

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