On the basis of Article 35 of the Environmental Protection Act (Official Gazette of the Republic of Slovenia [Uradni list RS], No. 39/06 - official consolidated version, 49/06 – ZMetD, 66/06 – Constitutional Court Decision , 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, 30/16, 61/17 – GZ, 21/18 – ZNOrg and 84/18 – ZIURKOE) in conjunction with Article 94 of the Nature Conservation Act (Official Gazette of the Republic of Slovenia, No. 96/04 – official consolidated version, 61/06 – ZDru-1, 8/10 – ZSKZ-B, 46/14, 21/18 – ZNOrg and 31/18) and on the basis of Article 54 of the Waters Act (Official Gazette of the Republic of Slovenia, Nos 67/02, 2/04 – ZZdrI-A, 41/04 – ZVO-1, 57/08, 57/12, 100/13, 40/14 and 56/15) and Article 109 of the Rules of Procedure of the National Assembly (Official Gazette of the Republic of Slovenia, Nos 92/07 – official consolidated version, 105/10, 80/13 and 38/17), the National Assembly, at a session on 5 March 2020, adopted the following

R E S O L U T I O N
on the National Environmental Action Programme 2020–2030 (ReNPVO20-30)

1 INTRODUCTION

Conserving nature and ensuring that the environment is of a high quality are important values of Slovenian society.

It is important to ensure that the water, air and soil are in a good condition, as is to ensure the conservation of biodiversity and valuable natural features, and Slovenia is increasingly aware that it is a part of a global society living on a planet with limited resources.

With a growing awareness of the importance of a healthy environment for the quality of life of both present and future generations, environmental protection is at the forefront of Slovenia’s development goals.

The state of most environmental elements in Slovenia is good; in particular, recent decades have seen an improvement in the quality of water and air, waste management, and an increase in the awareness of the importance of conserved biodiversity and valuable natural features. The level of knowledge and understanding of the connections between environmental pressures and the state of the environment have improved as well.

The improvement in the situation in this field is also due to the environmental protection policy, which was set out in the past by national environmental protection programmes on the basis of the results of environmental monitoring and taking into account the identified environmental protection challenges. These programmes are the National Environmental Action Programme (Official Gazette of the Republic of Slovenia, Nos 83/99 and 41/04 – ZVO-1; hereinafter: the NEAP 1999) and the Resolution on the National Environmental Action Plan 2005–2012 (Official Gazette of the Republic of Slovenia, No. 2/06; hereinafter: the NEAP 2005–2012).

Slovenia's future environmental challenges related to the traditional notion of environmental protection are mainly excessively polluted areas due to past activities, the annual short-term deterioration of air quality, concern for the conservation of biodiversity and valuable natural features, and adapting to and managing climate change.

The environmental challenges in the future are also of a systemic nature, especially the alarming threats to the environment’s capacity to enable future social development. Slovenia and Europe have achieved a high level of prosperity in a way that is

typical of practically all developed countries – with the excessive use and excessive pollution of the resources provided by the Earth.

Slovenia's future environmental challenges are not limited to its territory, as its environment will also be subject to significant and long-term impacts of processes on a global scale.

Green Slovenia, rich in forests, clean water, air and biodiversity, should not be taken for granted. It is up to us to take care of it so that this wealth can be enjoyed by our children as well.

Understanding the intertwining of environmental protection with social and economic processes and a shift towards an ecosystem-based development model with sustainable production and consumption are key to future environmental protection. It will be necessary to fundamentally change the systems that meet the needs of society, especially nutritional, mobility, energy and housing systems, as these have a decisive impact on the environment. Environmental protection will have to be ensured through a systemic approach and greater environmental coherence of all sectors of society, as well as an ambitious integration of environmental issues into the policies of other sectors.

As a result, the commitment to sustainable development may be even more important than in the past, and its practical implementation may be even more urgent – especially through radical changes in social and economic development, where a shift to more sustainable living, production and consumption is necessary, but not only on paper and in documents, but in practice and in everyday life. Furthermore, it must also not be immethodically implemented, but with a holistic, systemic view and approach, as well as implementing a multifaceted range of knowledge based on analyses of consequences and effects and, above all, social consensus.

The National Environmental Action Programme should therefore constitute a social consensus regarding the future environmental protection or environmental boundary conditions of Slovenia's development, which has a long tradition and an established administrative organisation of environmental protection, as well the support of non-governmental organisations and other professional institutions and individuals.

Slovenia has all the resources necessary to achieve environmental and sustainable excellence and to provide current and future generations with a high-quality life, taking into account the planet’s capacities.

2 PURPOSE

In order to achieve the environmental vision of PROTECTED NATURE AND A HEALTHY ENVIRONMENT IN SLOVENIA AND OUTSIDE ITS BORDERS WILL ENABLE CURRENT AND FUTURE GENERATIONS TO LIVE A QUALITY LIFE, the National Environmental Action Programme for the period 2020–2030 (hereinafter: NEAP 2020–2030) defines the guidelines, goals, tasks and measures of environmental protection stakeholders, namely:

- long-term guidelines, goals, tasks and measures in environmental protection;
- long-term guidelines, goals, tasks and measures in the conservation of biodiversity and protection of valuable natural features (National Nature Protection Programme);
- national water management policy (National Water Management Programme);
- measures to achieve the goals of the Development Strategy of Slovenia 2030, which recognises the preservation of a healthy natural environment among the strategic orientations for achieving a high quality of life;

- guidelines for the planning and implementation of policies of other sectors that also affect the environment;
- guidelines and measures for compliance with international development commitments (especially the 2030 Agenda for Sustainable Development – hereinafter: 2030 Agenda);
- guidelines and measures for compliance with international commitments in environmental protection, nature conservation and water management.

3 STARTING POINTS

3.1 The environment is an important value of Slovenian society

The people of Slovenia consider well-preserved nature and the quality of the environment in which they live to be important values.

They are aware of the importance of the good condition of waters, air and soil, with nature conservation being an important priority, and are increasingly aware that they are a part of a global society living on a planet with limited resources.

Moreover, recognising that global climate change processes are taking place that are threatening all living beings in an unprecedented way, society is becoming aware of the importance of protecting the environment and nature, and sees itself as part of the environment and nature.

The protection of the environment is thus losing its anthropocentric, human-oriented nature and being replaced with an eco-centric orientation, i.e. that which focuses on nature of which people are a part. Such an approach protects the intrinsic values of nature and adapts human actions so as to maintain the natural systems and thus natural balance. As nature makes life possible, but only if its cycles follow its own rhythm and are in balance.

The path of society's development must therefore be the path of awareness that natural balance is the framework in which all human activities take place and is the basis of human development.

3.2 Legislative Framework

NEAP 2020-2030 has been drafted in accordance with the Environmental Protection Act (Official Gazette of the Republic of Slovenia, Nos 39/06 – official consolidated version, 49/06 – ZMetD, 66/06 – Constitutional Court Decision, 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, 30/16, 61/17 – GZ, 21/18 – ZNOrg and 84/18 – ZIURKOE; hereinafter: the Environmental Protection Act), the Nature Conservation Act (Official Gazette of the Republic of Slovenia, Nos 96/04 – official consolidated version, 61/06 – ZDru-1, 8/10 – ZSKZ-B, 46/14, 21/18 – ZNOrg and 31/18; hereinafter: the Nature Conservation Act) and the Waters Act (Official Gazette of the Republic of Slovenia, Nos 67/02, 2/04 - ZZdrI-A, 41/04 - ZVO-1, 57/08, 57/12, 100/13, 40/14 and 56/15; hereinafter: the Waters Act), and combines the national environmental action programme, national nature protection programme and national water management programme.

In accordance with the Environmental Protection Act, the NEAP 2020–2030 provides long-term guidelines, goals and tasks in environmental protection. The NEAP 2020-2030 contains the following:
- a summary environmental report,
- goals of a certain period and measures for their implementation,
- priorities,
- guidelines for development of activities and public services for environmental protection,

- an assessment of the resources required for the implementation of programmes and their sources, and
- the obligations arising from ratified international treaties and EU strategies and programmes concerning environmental protection.

In accordance with the Nature Conservation Act, the National Nature Protection Programme defines the public interest concerning biodiversity conservation and the protection of valuable natural features, and determines the goals and guidelines for the following:

- biodiversity conservation through a programme of measures for the protection of plant and animal species and their habitats and ecosystems,
- protection of valuable natural features through a programme for the establishment of protected areas and the restoration of valuable natural features,
- the manner of fulfilling international obligations,
- education in nature conservation,
- raising public awareness of the importance of nature conservation,
- provision of financial resources for nature protection.

In accordance with the Waters Act, the National Water Management Programme determines the national water management policy that contains the following:

- an assessment of the water management situation,
- goals and guidelines for water protection, water regulation and sustainable use of waters,
- priorities for achieving water management goals,
- an assessment of the resources required for the implementation of the programme and time limits for achieving the goals, and
- guidelines for the implementation of international treaties concerning water management.

3.3 Our consumption and pollution exceed what the planet can withstand – an ecosystem-based approach to development is necessary

Environmental institutions, including the European Environment Agency, and individual eminent experts are warning of the problem of the currently prevailing development model where well-being (represented by the human development index) increases in parallel with the environmental footprint, i.e. the exploitation of natural resources and environmental pollution.

The environmental footprint or ecological footprint is a synthetic indicator of the environmental dimension of development calculated by the Global Footprint Network for about 200 world countries, including Slovenia. It is expressed in a standardised unit of biologically productive area, the so-called global hectare (gha), which means fertile surfaces necessary for satisfying human needs, including the need for food. It consists of the footprint of agricultural outputs, grazing, forest products, fisheries, the footprint of built-up areas and the carbon footprint.

Figure 1 presents the predominant development model with a combination of two synthetic indicators: the human development index and the country-specific environmental footprint. The red arrow shows the present development trend in which higher development level is accompanied by higher environmental footprint. Development therefore occurs without consideration for the environmental capacities of the planet.

We cannot and must not afford prosperity at the expense of increasing the environmental footprint. Human development must be separated from the use of natural resources and environmental pressures, and a combination of human development and

environmental footprint must be achieved in the direction shown by the green arrows in Figure 1, i.e. in the lower right quadrant marked in green (sustainability).

As developing countries follow developed countries in burdening the environment for economic growth, it is essential that all countries embark on a path of sustainable development immediately and decisively.

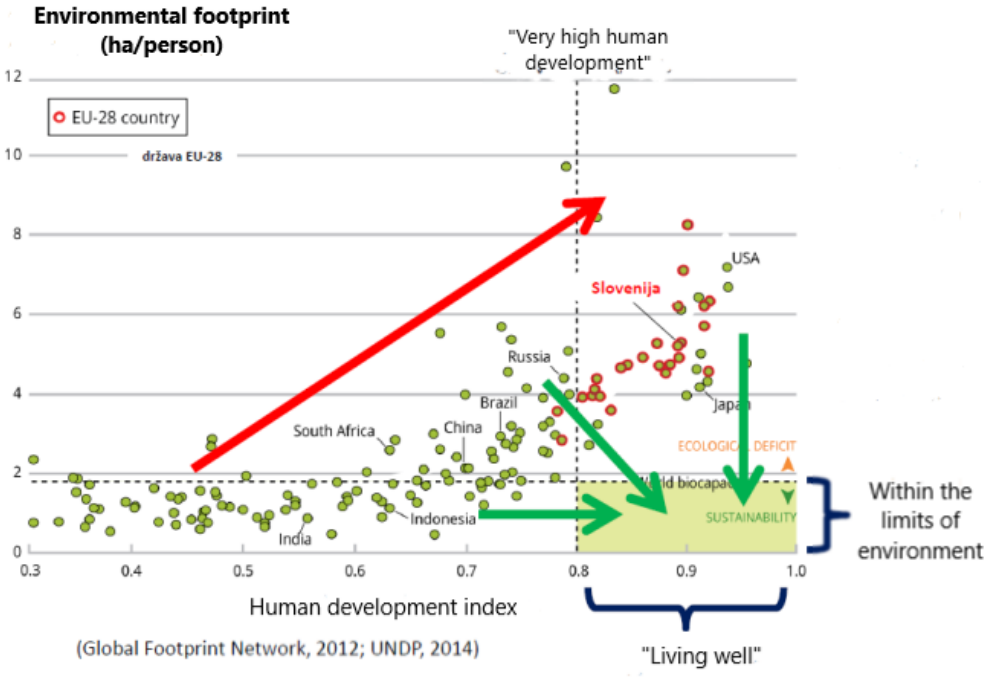

Figure 1: Development models and key challenge of the 21st century: living well, within the limits of our environment
Source: The figure is taken from the presentation of Hans Bruyninckx on 12 October 2016 in Ljubljana.

Achieving prosperity through excessive use of raw materials and ecosystem services of the Earth is also characteristic of Slovenia. According to the latest available data (for 2016), so many resources have been consumed that if humanity lived in this way, the Earth's resources available for the whole year would be consumed in 2019 by 27 April 2019. For the EU, this date (the Earth Overshoot Day) was 10 April.

Additional analyses of Slovenia's environmental footprint showed that in 2016 the ecological footprint in Slovenia was 5.1 gha, which exceeds that of the EU (4.6 gha) and most neighbouring countries (Figure 2), and the world average (2.75 gha) by over 80%.

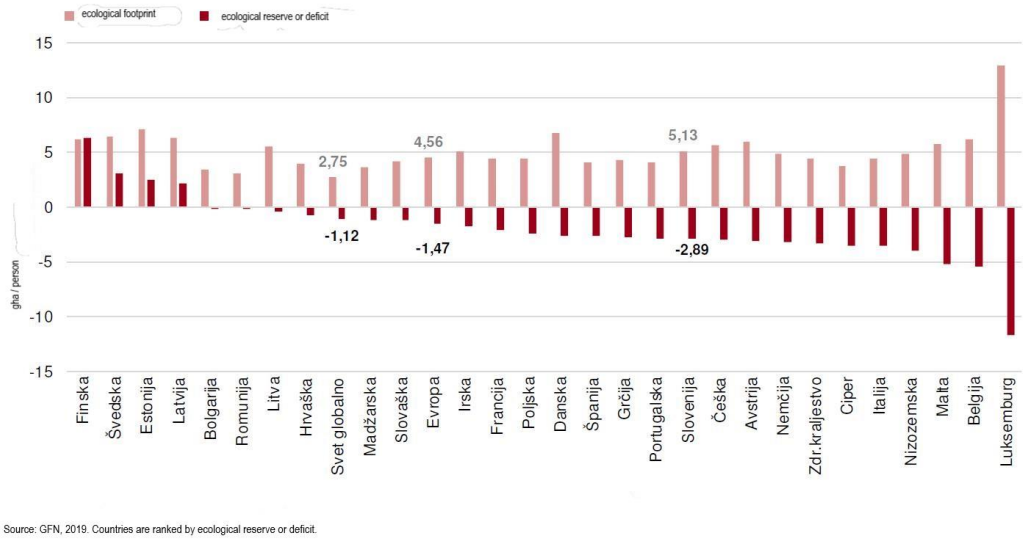

Figure 2: Ecological footprint and ecological reserve and deficit, respectively, 2016. Source: Kovač, M., Ekološki odtis Slovenije in EU v obdobju 2000–2016, UMAR, 2019

A comparison of the ecological footprint with the biological capacity of nature or biocapacity (i.e. those biologically productive areas that are able to regenerate and are also converted into global hectares) shows that Slovenia's ecological footprint in 2016 was more than twice as high as the country's biocapacity (2.2 gha), so the ecological deficit was 2.9 gha (Figure 2). This is equal to the regenerative capacity of 3.1 Earths – humanity as a whole would need 1.7 Earths to replenish the natural resources consumed each year.

Slovenia has managed to preserve the integrity of its ecosystems and to prevent their degradation to a much higher extent than the rest of the world. Nevertheless, the high demand for biocapacity is met through imports, especially of fossil fuels, which increase greenhouse gas emissions (hereinafter: GHG) and therefore the ecological footprint. An analysis of the structure of the ecological footprint for Slovenia shows the largest share of the carbon footprint (around 60%) that is a result of the use of fossil fuels. Most of the carbon footprint has been generated in two economic activities, namely transport and energy.

The only sustainable development path for Slovenia can be an accelerated reduction of the environmental footprint within the limits of the ecosystem capacity in conjunction with a moderate increase in or preservation of well-being. This vision is also supported by the commitment in the Development Strategy of Slovenia to reduce the ecological (environmental) footprint by 20% by 2030 (from 4.7 gha/person in 2013 to 3.8 gha/person). According to the European Environment Agency, such a development path requires a new development paradigm: ecosystem-based development.

The European Environment Agency notes that the implementation of the European environmental vision (“Living well, within the limits of our planet”) necessitates a systemic change of the development model, namely placement of fundamental social systems within the boundaries of ecosystems (Figure 3). Sustainable development is thus realised through economic, social and environmental development, which creates conditions and opportunities for present and future generations, where the state of ecosystems and their ability to provide ecosystem services to society determine the possibilities of its development (ecosystem services are self-cleaning and self-regenerating capacities of our environment which provide, among other things, clean air on which we depend, clean water we drink, clean soil for food production, fibre and wood).

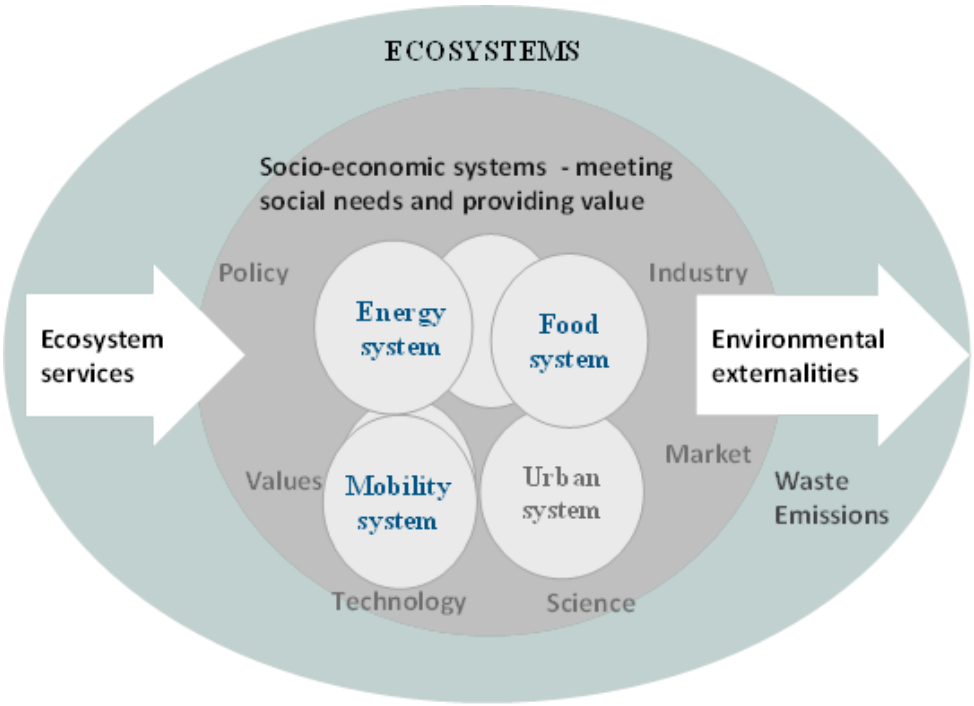

Figure 3: Ecosystem-based development model (placement of fundamental social systems within the boundaries of ecosystems)
Source: European Environment Agency

3.4 The state of the environment in Slovenia and the achievement of the environmental goals of the 2030 Agenda

The 2017 Slovenian State of the Environment Report drafted on the basis of indicators of the state of the environment, the results of monitoring and other data covers the characteristics of the environment in Slovenia in the 2009–2015 period. The key issues highlighted by the report are the following:

- the state of the environment is improving, which is the effect of the planned environmental policy and comprehensive environmental legislation adopted in recent decades. Water and air emissions of most pollutants have been reduced, waste management has improved, efforts to preserve biodiversity have been stepped up, and the causes of environmental challenges are better understood;
- the state of the environment in individual limited locations is a matter of concern, especially in terms of air quality and soil pollution, and better progress is needed for biodiversity conservation, material efficiency, sustainable land use and adaptation to climate change;
- for the most part, Slovenia is well on track to achieve the goals for major air pollutant emissions, the impact of polluted air on ecosystems, the ecological and chemical status of surface waters, groundwater chemical status, efficient use of substances and resources, waste management, greenhouse gas emissions and mitigation of climate change and adverse effects on human health due to water pollution;
- Slovenia is partly on track to achieve the goals for biodiversity status and air pollution with PM10 and ground-level ozone.

3.5 Implementation of the National Environmental Action Programme 2005-2012

In 2005, the National Assembly adopted the previous national environmental protection programme, NEAP 2005–2102, as the basic strategic document in environmental protection for the improvement of the environment and quality of life, as well as the protection of natural resources.

The programme emphasises the importance of environmental protection for sustainable development, and sets goals and measures for four areas: climate change, nature and biodiversity, quality of life, and waste and industrial pollution.

A review of implemented measures in climate change shows an increased awareness of climate change, a reduction in GHG emissions and ozone-depleting substances, and the achieved goal of the share of RES in the country's total energy supply. However, the goals regarding the reduction of energy intensity, the share of biofuels in transport and the share of cogeneration of heat and energy in electricity production have not been achieved. The NEAP 2005–2012 also set out tasks for the establishment of a GHG emission monitoring system, of which tasks related to GHG emission records and the Emissions Trading Scheme have been completed, while the tasks for climate change adaptation and monitoring of sinks for land use, land use change and forestry have not been completed.

In the field of nature conservation and biodiversity, important strategic documents were adopted on the basis of the NEAP 2005–2012 (Biodiversity Conservation Action Plan with the NATURA 2000 Area Management Programme, Natura 2000 Area Management Programme (2007–2013) and large carnivore population management strategies), and a management system for NATURA 2000 areas has been established. In activities with their own natural resource management plans (forestry, hunting, fisheries), these plans are also management plans for NATURA 2000. However, no strategic documents have been adopted on invasive non-native species and on the protection of valuable natural features. In areas important for the conservation of biodiversity, the founding acts for wider protected areas were not harmonised with the Nature Conservation Act and the founding acts for narrower protected areas were not adopted; a central unit for protected areas has not been established either and the goal of the area of protected areas reaching 10% of Slovenia’s surface has not been achieved. However, progress has been made for these areas in terms of their inclusion in agri-environmental programmes, their purchase, the restoration of their degraded parts and the system of compensation for limited property rights. Regarding the protection of valuable natural features, the goals regarding their protection, contractual protection or custody, information system, their restoration in nature and regulation or physical protection for those that may be endangered by viewing have been partially achieved. Regarding the monitoring of the biodiversity status, a comprehensive system has not yet been established, and a revision of the red list of endangered species has not yet been carried out. There are several reasons for the poor implementation of measures, from too ambitious goals and lack of political will to establish new protected areas to the reduction of funds due to the financial crisis and the redeployment of key personnel to other tasks.

In the field of quality of life, Slovenia has achieved the goals regarding the reduction of emissions of sulphur oxides (SOx), nitrogen oxides (NOx), non-methane volatile hydrocarbons (NMVOC) and ammonia (NH3) in its territory, but not the goals regarding daily limit values for PM10 particles and ground-level ozone. The goals regarding the management of chemicals and genetically modified organisms (hereinafter: GMO) have been achieved and water management measures have been implemented. In environmental noise protection, strategic noise maps have been made, while operational programmes with noise protection measures were delayed in the making.

The goals and measures in waste management and industrial pollution have been achieved and implemented, respectively.

The NEAP 2005–2012 also contained goals and measures in other areas where no or little progress has been made and challenges for future action remain: these are the integration of environmental protection into the policies of other sectors, use of economic instruments for environmental protection, the shift to sustainable consumption and production, and the restoration of degraded areas.

3.6 Consultations of the public in the preparation of the NEAP 2020–2030

Prior to the start of the preparation of the NEAP 2020–2030, two consultation sessions were held with representatives of non-governmental organisations and other professional institutions in environmental protection which contributed the following conclusions and guidelines:

- the programme will be a living document if the measures are agreed upon clearly and together with all stakeholders, while taking responsibility and constantly checking the effectiveness of its implementation. The preparation of the programme should be harmonised with other strategic documents. It should be considered a restrictive document of the community, setting out the boundary conditions of development. It should also identify challenges for which clear solutions are not yet known, as this is an awareness-raising task of the programme;
- conservation of a healthy environment and natural resources should be stressed as the primary public interest. An awareness of the limitations of natural resources and space must become the starting point for economic development and spatial planning. Slovenia's goal should be to establish an economy with a low environmental footprint ;
- the value system of environmental protection needs to be redefined: from technical levels and data to value systems;
- one of the strongest leverages of support actions is the harmonisation of regulations between sectors and the integration of environmental issues into development policies and policies of other sectors and into the Slovenian Development Strategy 2030. It would be reasonable to introduce an assessment of environmental and social impacts of all strategic documents. Strengthening inter-sectoral cooperation is also important in terms of coordinated financial incentives and support schemes;
- spatial planning should be understood as an effective instrument of supporting the achievement of environmental protection goals. Land use planning should be strategic in view of potentials and needs, not just responses to individual initiatives. An environmental impact assessment should be provided independently of the wishes of investors and policy makers. Studies involving strategic environmental impact assessment and environmental impact assessment of interventions should be carried out independently and involve all stakeholders. Early or timely public coordination and stakeholder education are very important instruments for integrating environmental and other policies;
- in support policies, environmental goals and measures should be introduced through comprehensive cost-benefit analyses;
- education and strengthening the competencies of existing staff, raising awareness in the field, and the planned, timely preparation and selection of human resources for positions of responsibility, as well as better informed policy planning and implementation officials are also of great importance for environmental protection. The practical implementation of the mechanism of public participation should be of high quality;
- the use of natural resources must be viewed holistically, on the basis of evaluated ecosystem services and the benefits of natural capital, and the external costs included in the price of products and services. Natural capital should be understood as a development potential and not as a development obstacle. Different interests regarding the use of natural resources should be harmonised transparently, on the basis of established decision criteria. The state is the biggest threat to environmental protection, so it is necessary to establish mechanisms for coordinating priority areas (economic versus environmental) and to coordinate various sectoral policies (e.g. economic,

environmental, financial, agricultural, general development) that should be based on professional principles. Accordingly, development indicators should also be more comprehensive and not focused primarily on the gross domestic product;
- the quality of the legislation in force is mostly good; what is needed is the reinforced supervision of the practical application of legislation, which is one of the most important implementation levers;
- significant future challenges identified are the mitigation of and adaptation to climate change, use of degraded surfaces and preservation of ecosystem services of soil, and approximation to net zero built environment. The quality of data and monitoring should be improved as this is important for the reliability of analyses and forecasts. The accessibility of environmental data should also improve.

3.7 International development and environmental commitments

The NEAP 2020–2030 implementation will contribute to meeting international development and environmental commitments.

The 2030 Agenda adopted in 2015 at the United Nations Organization summit is an agreement of the international community to eradicate poverty, reduce inequality, ensure progress, and protect the environment for present and future generations. By means of the 2030 Agenda, 193 countries, including Slovenia, committed to a plan that, in a balanced manner, connects three sustainable development dimensions – economic, social, and environmental – and intertwines them in ensuring 17 goals and 169 targets of sustainable development. The 2030 Agenda is a turnabout in the paradigm of global development, which to date has been based (primarily) on flows of development aid from developed countries to less developed countries: the global sustainable development goals are universal (for all countries), interconnected and inextricably linked.

The implementation of the NEAP 2020–2030 will contribute to the achievement of the global sustainable development goals as defined in the 2030 Agenda, as the environment is directly or indirectly included in most of the sustainable development goals, in particular in the following:

Goal 2: end hunger, achieve food security and improved nutrition and promote sustainable agriculture;
Goal 3: ensure healthy lives and promote well-being for all at all ages;
Goal 6: ensure the availability and sustainable management of water and sanitation for all;
Goal 7: ensure access to affordable, reliable, sustainable and modern energy for all;
Goal 8: promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;
Goal 9: build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation;
Goal 11: make cities and human settlements inclusive, safe, resilient and sustainable;
Goal 12: ensure sustainable consumption and production patterns;
Goal 13: take urgent action to combat climate change and its impacts acknowledging that the United Nations Framework Convention on Climate Change (hereinafter: the UNFCCC) is the primary international, intergovernmental forum for negotiating the global response to climate change;
Goal 14: conserve and sustainably use the oceans, seas and marine resources for sustainable development;
Goal 15: protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

With regard to international environmental commitments at the global level, the implementation of the NEAP 2020–2030 will primarily support commitments concerning biodiversity conservation and climate change mitigation.

With regard to biodiversity conservation, the NEAP 2020–2030 also contains measures to implement the Convention governing biological diversity (hereinafter: the Convention on Biological Diversity) and the Strategic Plan 2011–2020 for biodiversity conservation, which contains the so-called Aichi Targets.

With regard to climate change mitigation, the NEAP 2020–2030 takes into account the commitments of the UNFCCC from 1992, which is the umbrella international document for combating climate change. More detailed commitments on GHG emissions for the 2005–2020 period are set out in the Kyoto Protocol to the UNFCCC and for the period after 2020 in the Paris Agreement, whose goal is to hold the increase in the global average temperature to below 2°C above pre-industrial levels. This means that all developed countries of the world must reduce their GHG emissions by at least 80–95% by 2050, while all developing countries should at least halve their GHG emissions (compared to verified GHG emissions in 1990). Additional efforts will be needed to achieve the goal of limiting the increase in the global average temperature below 1.5°C, which, according to relevant institutions (such as the IPCC and UNEP) and scientists, is the limit to which man-made climate change is still manageable for the transition to sustainable development. The IPCC Special Report titled Global Warming of 1.5°C (http://www.ipcc.ch/report/sr15/) – serving as the basis for the initiation of political and scientific discussion on the necessary increase in the ambition of signatories for the preparation and submission of the final quantified goals of NDCs (National Determined Contributions) by 2020 at the latest – states for the Paris Agreement target of 1.5°C that achieving this target at global level is still technically possible, but only if total global GHG emissions by 2030 are halved in comparison to 1990 and GHG neutrality or carbon neutrality is achieved in 2040–2055. Most UNFCCC signatories must considerably increase their climate goals to follow the trajectory already for the goal of 2°C.

In 2014, the European Council set a common climate goal at EU level: to reduce GHG emissions by at least 40% by 2030 compared to 1990 and by at least 80% by 2050. By 2030, separate targets for reducing emissions from ETS activities have also been set at EU level (ETS activities are those included in the Community scheme for greenhouse gas emission allowance trading) (–43% compared to 2005) and non-ETS activities (–30% compared to 2005). The target for non-ETS activities is distributed among the member states in the range from 0% to –40% in view of the development level of individual countries and other criteria. The target set for Slovenia is –15% for non-ETS activities.

3.8 Impacts of global long-term patterns of change (global megatrends) on the environment in Slovenia: important messages

Although the EU has achieved significant progress regarding the environment, long-term forecasts are less favourable. The primary reasons are the systemic characteristics of environmental challenges and interdependence with the global development changes. The European Environment Agency notes that the EU's environmental vision by 2050 can only be achieved through a fundamental change in the systems that meet society's needs, along with profound changes in the prevailing structures, practices, technologies, policies, lifestyles and way of thinking. Sustainability transitions of our production and consumption systems are needed – especially the systems related to energy, mobility, food and housing, which are the root cause of environmental and climate pressures. Our efforts are going towards the transition to a low-carbon, circular and bio-economy, for which the EU has already adopted agendas. Sustainability transitions, however, require systemic innovations – integrated system innovations that include both technological and social innovations and a paradigm shift in knowledge and management development, innovation and vision.

Some of the environmental and climate problems we face today depend not only on the actions in Europe, but also on what is happening around the world – especially the significant changes that are happening at the global level, the so-called global megatrends (hereinafter: GMT). GMT are any major social, economic, environmental, political or technological change that is slow to form – such as population trends, technological development, digitalisation and increasing environmental pressures. Once established, it can influence a wide range of activities, processes and perceptions. Its impact is long-term, reaching over decades.

The European Environment Agency has comprehensively studied the impact of GMTs on the environment in Europe and beyond for many years. At its initiative, a study was carried out in 2017 and 2018 on the impact of two GMTs on the environment in Slovenia: GMT 7 – the intensified global competition for resources, and GMT 9 – the increasingly severe consequences of climate change.

The results of the study show that the consequences of these GMTs are felt in several sectors (e.g. agriculture, forestry, business, technology, industry, transport, tourism). They may also impact food production and food security, trade and resource dependence, environment, human health and vulnerability. The assessment of impacts and consequences has been summarised in ten key messages for Slovenia:

- a changing and more variable climate presents emerging challenges for Slovenia's agricultural sector and the security of food production,
- Slovenia's relationship with Europe and the world may lead to increasing trade and resource dependence,
- multiple and conflicting land demands are leading to increased pressures on Slovenia's limited fertile areas,
- transport is a key driver for environmental change and health-related risks in Slovenia,
- the continued economic development of Slovenia is likely to lead to increasing pressure on the natural environment,
- recognising and understanding trade-offs between economic sectors can help set common sectoral sustainability goals,
- environmental and economic changes in Slovenia may lead to more people becoming vulnerable,
- technological and behavioural changes may help Slovenia move towards a more sustainable and secure future,
- Slovenia's reputation as a high-value tourism destination could be threatened by the environmental impacts of mass-tourism,
- to improve resource management, environmental and economic governance, Slovenia needs to recognise the value of natural capital.

3.9 Systemic characteristics of environmental challenges

According to a report from the European Environment Agency titled The European Environment. State and Outlook 2015. Synthesis Report, environmental challenges have certain systemic characteristics that affect the way they are addressed; namely:

- they are multifaceted, i.e. there are several causes for them and in several respects there is an interdependence between the key processes and factors behind them and the related effects,
- they are interdependent and related to the social and economic system,
- they are inseparable from the patterns of consumption and resource usage,
- environmental drivers, trends and impacts are increasingly globalised,
- they are dependent on European and global patterns of change (GMT's) such as population growth, the spread of urbanisation, accelerated technological change, economic growth and the redistribution of economic power, competition for resources,

pressures on ecosystems, increasingly severe consequences of climate change and increasing environmental pollution.

3.10 Strategic nature of the NEAP 2020–2030

The NEAP 2020–2030 is the umbrella strategic document for environmental protection, nature conservation and water management in Slovenia.

In its preparation, it was taken into account that some environmental issues are regulated in more detail by already adopted programmes in environmental protection (e.g. waste management, reduction of greenhouse gas emissions) and that a detailed consideration of some environmental issues (air quality, noise protection, climate change mitigation, adaptation to climate change) has been provided for in other documents.

The NEAP 2020–2030 has been drafted taking into account that different areas of environmental protection are characterised by different levels of data, knowledge and the ability to manage them. In traditional areas of environmental protection (e.g. nature protection, air and water protection), environmental protection systems are already in place, and this programme addresses the content on the basis of available concrete data, in depth and with more concrete guidelines, goals and measures. However, when addressing issues related to recent challenges or those that have been identified but not addressed in the past (e.g. the restoration of contaminated areas, use of economic instruments of environmental protection, climate change adaptation), the goals, guidelines and measures are addressed less specifically and indicate the need for further considerations, the preparation of expert bases and regulations or more detailed implementation documents.

4 GUIDELINES AND GOALS FOR ENVIRONMENTAL PROTECTION, NATURE CONSERVATION AND WATER MANAGEMENT

The environmental vision of PROTECTED NATURE AND A HEALTHY ENVIRONMENT IN SLOVENIA AND OUTSIDE ITS BORDERS WILL ENABLE CURRENT AND FUTURE GENERATIONS TO LIVE A QUALITY LIFE will be achieved by measures of three strategic orientations:

- protect, conserve and improve Slovenia’s natural capital,
- ensure the transition to a low-carbon and resource-efficient society that prevents waste and treats generated waste efficiently,
- protect the population from environment-related risks (environmental risks).

The measures of these strategic guidelines will contribute to the achievement of the following goals:

1. the measures for the protection, conservation and enhancement of the natural capital will:
   - maintain a high degree of biodiversity and protect valuable natural features,
   - improve the quality of soil,
   - reduce the net growth of built-up land,
   - improve the air quality to a level where there is not an excessive concentration of pollutants,
   - achieve a favourable chemical and ecological status of all surface waters,
   - achieve a favourable chemical and quantitative status of all groundwater,
   - preserve the marine environment;
2. measures for the transition to a low-carbon and resource efficient society that prevents waste and treats the generated waste effectively will:
   - reduce greenhouse gas emissions in accordance with adopted international commitments,

- make progress in waste prevention, while the waste generated will be prepared for reuse, recycled or recovered as a matter of priority,
- reduce resource usage and increase material and energy efficiency;

3. measures for protecting the population from environmental risks will:
   - restore a part of areas excessively polluted in the past,
   - maintain the trend of reducing the number of people exposed to excessive environmental noise,
   - maintain the safe use of biotechnology and its products,
   - reduce the presence of hazardous chemicals in the environment,
   - improve the management of burdens caused by electromagnetic field sources and light pollution,
   - reduce the exposure, sensitivity and vulnerability to climate change impacts by increasing the resilience and adaptive capacity of society.

5 PROTECTION, CONSERVATION AND ENHANCEMENT OF THE NATURAL CAPITAL

Human existence depends on nature, as the latter provides the basic conditions for human existence: fertile soil, multi-purpose forests, productive areas and seas, high-quality water and clean air, which make up natural capital.

With and among its elements, natural capital also creates flows that we understand as ecosystem services – for example: the supply of biomass, water and fibre, soil formation, pest and disease control, the nutrient cycle and climate regulation.

A result of the complexity of natural systems and the irreversibility of some changes in these systems is that the replacement of natural capital with other capital is mostly impossible or is associated with risks. The risks and costs associated with the impoverishment of ecosystems and their services have not yet been given due consideration in development decisions.

The NEAP 2020–2030 deals with the protection, conservation and improvement of the following components of Slovenia's natural capital: nature with biodiversity and valuable natural features, soil, air and water.

The NEAP 2020-2030, however, does not deal with forests, which are also an important natural capital of Slovenia, since they are already dealt with in the Resolution on the National Forest Programme (Official Gazette of the Republic of Slovenia, No. 111/07). The basic premise of the programme is the recognised importance of forest biodiversity and sustainable management. Sustainable forest management in Slovenia has more than a century of tradition, the principles of such management are built into forest management planning, and the property right on forests is exercised by taking into account their ecological, social and production functions. Ensuring a favourable conservation status of species and habitat types in the forest area is thus built into the planned forest management. As a result, due to the favourable condition of the populations of species and habitat types important at the European level, Natura 2000 areas cover more than 50% of Slovenian forests. The useful role of forests in soil protection, in the prevention of erosion processes, in the prevention or mitigation of floods, in the carbon sink, in the provision of drinking water sources and in the provision of habitat for many endangered species, including large carnivores, has also been recognised. The implementation of the National Forest Programme therefore also contributes to the achievement of the goals of the NEAP 2020–2030.

5.1 Biodiversity and valuable natural features – National Nature Protection Programme

The National Nature Protection Programme (hereinafter: the NNPP) defines the scope of public interest in biodiversity conservation and protection of valuable natural features.

Biodiversity and natural values are the substantive foundations of the NNPP, for which goals and guidelines have been determined that will be implemented in practice through measures of the Programme for the Protection of Plant and Animal Species and their Habitats and Ecosystems, and the Programme for the Establishment of Protected Areas and the Restoration of Valuable Natural Features (Table 1) and the Strategic Plan of Biodiversity Conservation in Slovenia referred to in Chapter 10 of the Programme.

The landscape is considered among valuable natural features as one of the categories (landscape value) and in biodiversity (landscape features important for biodiversity conservation).

In biodiversity conservation, the following documents have already been adopted on the basis of the Nature Conservation Act:

- Natura 2000 Area Management Programme (hereinafter: the PUN) governing the conservation of the principal part of biodiversity (plant and animal species and habitat types that are a common concern of the EU),
- strategies of managing large carnivores: brown bear, wolf, lynx.

The NEAP 2020–2030 as a whole, and in particular the NNPP, constitutes Slovenia's strategic document for the implementation of the global goals of biodiversity conservation (Aichi Targets) in accordance with Article 6 of the Convention on Biological Diversity, which determines that each Contracting Party shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose the existing strategies, plans or programmes, and integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. Through the PUN, the aforesaid strategies, and programme and strategic documents of other sectors (e.g. agriculture, forestry), Slovenia has already begun implementing measures that support the achievement of the global goals.

All measures necessary for the full achievement of global biodiversity conservation goals are collected in the Strategic Plan for Biodiversity Conservation in Slovenia referred to in Chapter 10, the objectives of which must be addressed together with the long-term goals and guidelines of the NNPP, measures listed in Table 1 and other chapters of the NEAP 2020–2030 (mainly on soil, water, biosafety and support measures).

The planned measures of biodiversity conservation and the protection of valuable natural features will be implemented in protected areas and broader in Natura 2000 areas. These areas are published in the Environmental Atlas at the following link: http://gis.arso.gov.si/atlasokolja/profile. aspx?id=Atlas_Okolja_AXL@Arso. No additional expansions of NATURA 2000 areas are planned, but the expansion of wider protected areas is planned as shown in Figure 4.

Current situation and challenges in biodiversity conservation

Biodiversity means the variability of living organisms at genetic, species and ecosystem levels. Biodiversity conservation in Slovenia focuses on the definition and conservation of threatened and internationally protected species. They are protected by a protection measure (comprising animal and plant species, fungi, cyanobacteria…), which means the protection of specimens (populations) and the preservation of their habitats. Conservation is carried out by the in-situ conservation of ecosystems and natural habitats, conservation of landscape features and the maintenance and strengthening of viable

populations of species in their natural surroundings. The key network that ensures the habitats of species at risk at the European level is the Natura 2000 network.

Biodiversity in Slovenia is declining despite the implementation of measures for its conservation. This is largely due to the loss of habitats, a consequence of non-sustainable spatial management.

The status of species whose habitat is considered agricultural land and the habitat types associated with that habitat is deteriorating. Agricultural land provides a habitat for these species and habitat types, so it is important to ensure that such use is not abandoned. On the other hand, the intensification of agriculture is a major threat to the favourable status of species and habitat types important at the European level (in the NNPP, the intensification of agriculture means the use of a farming technique or a change to this technique in a way that adversely affects biodiversity). Many water-related habitat types, including wetlands, are also in a poor state of conservation. A strong threat is the anthropogenic alteration of aquatic ecosystems. The condition of the forests is good, including some typical species that live there (e.g. wolf, bear), with the exception of special forest habitats and habitat types (e.g. in lowland floodplain forests). In Slovenia, recorded pressures and threats to species and habitat types important at the European level include construction, especially due to urbanisation, industrialisation and transport, and the intensification of agriculture and therefore the fragmentation of living space, and badly thought-out ways of regulating watercourses, also with a view to ensuring flood safety. Further pressures at the local level are also brought about by energy production, especially certain forms from renewable sources. The situation is further aggravated by climate change and the spread of invasive species.

Biodiversity is increasingly threatened by the poorly controlled and inappropriate handling of animals taken from the wild, so systemic solutions related to captivity, breeding, public display, trade, and other commercial purposes need to be improved.

One of the most important challenges is to integrate biodiversity conservation goals in the policies of key sectors. In particular, spatial development should focus on harmonising economic, social and environmental aspects to ensure biodiversity conservation in the planning of the green system of urban areas and green infrastructure at the level of the state, regions and municipalities. There is a need to make better use of instruments, such as the assessment of plans and programmes to implement the policies of other departments, and to ensure that the biodiversity conservation measures identified in the plans and programmes are put into practice.

The key operational challenge is to strengthen the established organisational framework of institutional nature protection operations, in particular to respond to new and upcoming content, strengthen the supervisory functions and the capacities of supporting professional institutions, and seek new sources of funding (e.g. EU and private sector funds).

Regarding biodiversity conservation, the importance of preserving landscape features and addressing non-native species and genetic resources is emphasised below. These are topics that need additional attention due to new international obligations and the implementation of common EU legislation.

Conserving landscape features important for biodiversity

In accordance with the Act Ratifying the European Landscape Convention (Official Gazette of the Republic of Slovenia – International Treaties, No. 19/03) and the Nature Conservation Act, Slovenia must protect, plan and manage landscapes and, among other things, determine the landscape diversity and landscape characteristics important for

biodiversity conservation, as well as guidelines for the preservation of valuable natural landscape features and biodiversity in the landscape.

Landscape diversity and landscape characteristics important for biodiversity conservation mostly depend on natural processes and the social and economic situation. Due to diverse geographical conditions and thousands of years of land cultivation, the prevalent landscape in Slovenia is mosaic: its components are small structures (watercourses and other aquatic phenomena, individual trees or groups of trees, hedges, hedgerows, dry stone walls, tree lines), extensive agricultural land (e.g. meadows and pastures with little or no fertilisation), a mosaic interweaving of fields with different crops and a sustainably managed forest. Landscape simplification, which causes the disappearance of natural structures and cultural elements in the landscape, reduces the mosaic structure of landscapes and thus landscape diversity and biodiversity.

In order to protect landscape features relevant to biodiversity, it is necessary to preserve the features that define parts or elements of the landscape as a landscape feature. The decisive factor for preserving landscape features important for biodiversity is activities which affect the physical environment. Especially in the areas of agriculture intensification, landscape diversity is diminishing and landscape characteristics are disappearing, which leads to the loss of diversity in habitats and species.

Influence of non-native species and use of genetic resources on biodiversity conservation

More than 900 non-native species of animals, plants and fungi have been recorded in Slovenia; the populations of about 30 plant and 30 animal species are so large as to be invasive and which therefore affect biodiversity. However, Slovenia does not have a system of protection against invasive non-native species (hereinafter: INNS) that would, in accordance with international obligations and for the implementation of the EU regulation governing the prevention and control of INNS introduction and spread, act preventively while also providing early detection and the rapid removal of INNS and the management of widespread INNS.

Slovenia also lacks an established unified system of rules for access to genetic resources and sharing the benefits arising from their utilisation for their users (these are mainly researchers and companies – e.g. in agriculture, the food industry, forestry, pharmacy, medicine, cosmetic industry, biotechnology) in accordance with the EU regulation on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation. The extent and methods of using genetic resources and their exchange and storage in collections in Slovenia are not fully known. An assessment of this situation should be made and a decision should be taken as to whether the field of access to genetic resources should be regulated in Slovenia and the benefits arising from their utilisation should be shared. Regular monitoring of the fulfilment of the obligations of users of genetic resources, in particular in their utilisation, development of new products, marketing and storage in collections, will also need to be upgraded.

Current situation and challenges in the protection of valuable natural features

Valuable natural features (formerly known as natural sites of special interest, natural and rarities or natural heritage) include assorted, exceptional parts of nature, which have been, since the early 20th century, recognised and collected by individual experts, nature conservation organisations and services as outstanding in relation to other parts of nature.

Natural values are crucial for the visibility of Slovenia's nature, and, at the same time, some have a symbolic meaning for the population's identification with their homeland. Conservation of valuable natural features is an obligation arising from the Constitution of the Republic of Slovenia: in accordance with the law, everyone is obliged to protect natural sites of special interest and rarities; the state and local communities strive to preserve the natural and cultural heritage. It follows from this obligation that everyone has the right to know and experience valuable natural features.

Valuable natural features of geomorphological, geological, hydrological, arboreal and designed types are mostly in good condition.

Some valuable natural features of the hydrological type are in a less favourable condition, mainly due to interventions in watercourses that cause the loss of the natural state of riverbeds and the natural functioning of hydrological processes. Of the 10,725 underground caves recorded in the cave cadastre, 153 are characterised as destroyed and 385 as contaminated with waste. It is estimated that the number of contaminated caves is significantly higher (about 1,000) than that recorded in the cave cadastre. Underground caves are still significantly burdened by the polluted water flowing from surfaces. The burden is heaviest on valuable natural features of living nature (botanical, zoological and ecosystem species), so many are in an unfavourable state. The sources of burdens are the same as the sources of burdens on biodiversity.

Some valuable natural features are excessively burdened due to general or specific use. Patterns of changes in the use of valuable natural features in a way and for purposes that, in addition to material properties, also threaten the value and symbolic side of valuable natural features have been perceived: these are the use of valuable natural features for sports and other activities, changing properties of valuable natural features (e.g. with artificial sound and light effects) and restricting free access to valuable natural features.

Goals in biodiversity conservation and protection of valuable natural features

Recognising the importance of responsibility for about 1% of the global biodiversity and importance of valuable natural features at the national level, Slovenia will in the long term, through measures of the Programme for the Protection of Plant and Animal Species and their Habitats and Ecosystems and the measures of the Programme for the Establishment of Protected Areas and the Restoration of Valuable Natural Features (Table 1) and the measures of Strategic Plan of Biodiversity Conservation in Slovenia referred to in Chapter 10:

1. maintain a high level of biodiversity and
2. conserve valuable natural features;

while achieving the following objectives:

a) regarding biodiversity:
    1. maintain the favourable status of native wild species,
    2. maintain the favourable status of the scope and quality of habitat types, especially those in ecologically important areas and Natura 2000 areas (goals and measures are defined in the PUN),
    3. prevent the introduction and spread of invasive non-native species and control their introduction and spreading,
    4. recognise, evaluate and preserve landscape diversity and landscape characteristics important for biodiversity conservation,
    5. monitor the situation to an extent that enables the determination of the level of conservation of all species important at the European level, and species and habitat types crucial as indicators of the status, and the status of valuable natural features,

6. monitor and improve the treatment of wild animal species taken from the wild for captivity, breeding, public display, trade or other purposes,
7. ensure the fair and just sharing of benefits from the utilisation of genetic resources and their subsequent use and marketing,
8. map and evaluate ecosystem services and consider their value in the preparation and adoption of development, spatial and other strategic or operational documents,
9. establish and maintain key green infrastructures,
10. improve knowledge about biodiversity and its importance at all levels of society;

b) regarding valuable natural features:
11. conserve valuable natural features in a long run and in a way that minimises the change in their value-related properties,
12. use valuable natural features in a way that, as a priority over other forms of general or specific use, enables everyone to get to know and experience natural values in their natural characteristics and resources,
13. regulate and control the general and specific use of valuable natural features without negative effects on the value-related properties of valuable natural features,
14. refine the data on valuable natural features and their condition, including value-related properties by individual types,
15. regularly monitor the status of valuable natural features;

c) regarding protected areas:
16. effectively manage the already established protected areas,
17. establish new broader protected areas (cartographic presentation in Figure 4) and narrower protected areas, on the most sensitive surfaces in terms of nature conservation as a priority;

č) regarding supervision:
18. establish direct control of nature throughout Slovenia,
19. establish a variety of connected and effective supervision services in the area;

d) regarding information systems and database:
20. establish an information system for nature conservation;

e) regarding awareness and communication:
21. raise awareness of the significance of nature protection in all levels of society;

f) regarding financial and other measures:
22. provide stable, sufficient, transparent and effective funding of nature protection,
23. improve interdisciplinary cooperation, cross-sectoral integration and an integrated approach,
24. provide financial incentives for biodiversity conservation and protection of valuable natural features;

g) regarding international activities:
25. comply with international obligations with a competent and financially strengthened competent authority for the implementation of ratified international treaties in nature protection,
26. enhance international cooperation in nature protection,
27. accede to international agreements in nature protection to which Slovenia has not yet acceded,
28. improve involvement of the ZRSVN, ARSO, protected area managers (hereinafter: PA managers), research institutions and other important institutions in the work of decision-making bodies and expert bodies at the EU and UN levels,
29. support financial and other measures that will have a positive impact on nature, reduce poverty and mitigate the effects of climate change, and increase development aid to this end,
30. observe in decision-making processes the most reliable scientific findings and adopt decisions that increase the effectiveness of international agreements,
31. achieve a more prominent position of Slovenia in the bodies of international organisations, especially under the auspices of the UN.

Guidelines and measures for biodiversity conservation and protection of valuable natural features

Achieving these goals will require an improved understanding of biodiversity and knowledge and awareness of its importance at all levels of society through more focused research and monitoring of the status of biodiversity.

Enhanced interdisciplinary and cross-sectoral cooperation and an integrated approach to the implementation of international, national and local strategies on biodiversity issues will need to be ensured, as well as greater a involvement of biodiversity conservation stakeholders in decision-making processes, especially at the implementation level.

Administrative, professional and supervisory bodies will need to be strengthened to carry out their tasks, especially in new fields such as access to and utilisation of genetic resources, and invasive non-native species.

In order to achieve these goals, it will be necessary to provide financial resources and eliminate incentives that are harmful to biodiversity (in line with Aichi Target 3).

In order to achieve the goals of biodiversity and the preservation of valuable natural features, the measures set out in Table 1 and Chapter 10 will be implemented, and in particular the following important nature protection instruments will be used:

Protected areas

Protected areas are natural areas with great biotic, abiotic and landscape diversity, and a high density and diversity of valuable natural features. In Slovenia, protected areas are one of the key instruments for nature conservation, namely the protection of biodiversity, landscape diversity and valuable natural features, which also contributes to the socio-economic development of regions.

Protected areas constitute added value in the area due to conserved nature, since conserved nature provides important ecosystem services and benefits (restoration of water resources, provision of clean air, etc.) and the physical and spiritual relaxation of people in the natural environment, strengthens the visibility of the area and enriches the cultural pulse of settlements, and offers opportunities for additional development opportunities (brand development, new jobs, provision of new tourist facilities, implementation of coordinated mechanisms to support the population). By achieving international status and joining the international network, these areas are also an important indicator of the preserved nature and implementation of the 2030 Agenda goals at the national and local levels.

Protected areas cover 14% of the territory of Slovenia. Slovenia has 49 broader protected areas (1 national park, 3 regional parks, 45 landscape parks; 8 areas have managers) and 1335 narrower protected areas (1 integral natural reserve, 56 natural reserves and 1164 natural monuments and 114 monuments of designed landscape; 96 areas have managers).

Guidelines:

- The implementation of nature protection measures in protected areas must be specifically included in the implementation of other activities in these areas. Their effective management with a focus on nature protection tasks and the coordinated action of stakeholders in nature protection, agriculture, forestry, business and cultural heritage will contribute to this. Ministries competent for these fields should take up a more active role in the preparation, implementation and co-financing of management plans.

- The implementation of activities in protected areas, especially development plans of all key sectors, should support the achievement of protection goals of nature conservation.
- New protected areas will be established, as a matter of priority, in the areas most sensitive in terms of nature protection, which will need regimes and management. On this basis and in view of the proposals of local communities, broader protected areas will be, as a matter of priority, established in the following areas important in terms of nature protection: Kočevsko, Planinsko polje, Pohorje, Dragonja and Mura, which will increase the surface of protected areas in Slovenia by at least 2%.

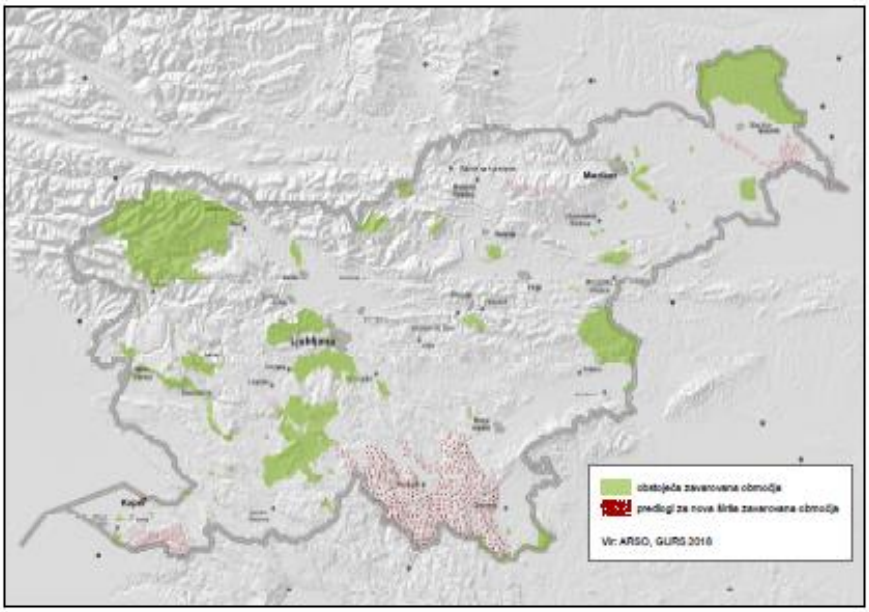

Figure 4: Map of existing protected areas and proposed areas of new broader protected areas

Direct nature protection control

Direct nature protection control is not only a task for inspectors, but also for nature protection supervisors; it is carried out in protected areas by the managers of these areas. Outside these areas and where protected areas are without a manager, control is carried out by the ministry responsible for nature conservation and additionally in the areas of natural assets by persons in charge of steering their sustainable management (e.g. Slovenian Forest Service, Fisheries Research Institute of Slovenia).

Control in protected areas is carried out by managers, while, outside them, such control should be systematically and fully strengthened or established.

Guidelines:

- A continuation of the establishment of the nature protection control service, preferably in a manner that allows public law entities established for steering the sustainable management of natural resources and, outside protected areas, the ministry responsible for nature conservation to participate in the implementation.
- Improving the connection between direct control in nature and the operation of inspection services, the police and the financial administration in order to achieve greater control efficiency.

Education for nature conservation

Nature protection activities and behaviours in society that can contribute to nature conservation extend to all areas of social activities and affect all generations. An individual

with a proper interdisciplinary education is therefore a key factor in achieving the goals of this programme. It is therefore important to acquire knowledge about nature and awareness of the importance of its preservation in the education system and in informal forms of education.

Guidelines:

- Ensure an adequate scope of acquiring knowledge from basic natural sciences, especially biology and ecology, in educational programmes for all professions that in any way concern interventions in nature.
- Establish regular training for services working in biodiversity conservation and management of its components for their high-quality performance of tasks.

Public awareness of the importance of nature conservation

The focus on direct personal communication, such as stakeholder discussions, lectures, field actions and guided tours, has resulted in an above-average level of information and public awareness at both EU and national levels. The activities of the ZRSVN, ZGS, PA managers and non-governmental organisations have all contributed to this. In recent years, the focus of awareness-raising efforts has shifted to projects co-financed from EU funds and programmes. An important aspect of this is that the project-based implementation of awareness-raising activities is harmonised in terms of content and time.

Guidelines:

- Carry out the long-term planning of awareness-raising efforts by combining the activities of state bodies, public institutions and non-governmental organisations. Inform the general public about the links between climate change and its effects on ecosystems and biodiversity.
- Strengthen the education and awareness-raising capacities of public services working in biodiversity conservation, together with the use of targeted communication methods and modern forms of communication that are familiar to young people. Protected area managers should particularly serve as a role model in this process.

Monitoring of the status of biodiversity and valuable natural features

Data on the occurrence of species, their habitats and habitat types and on the status of valuable natural features are necessary to determine the status of biodiversity and valuable natural features and to monitor the effectiveness of implemented measures, to inform and raise public awareness and report at the international level (especially to the EU bodies and in international conventions). Data are also important for the assessment of the conformity of plans and programmes and projects in administrative procedures of an (comprehensive) environmental impact assessment. In recent years, monitoring has been carried out only for certain groups: crustaceans, beetles, butterflies, fish, birds, bats and large carnivores. In the future, the scope of species and habitat types covered by monitoring should be broadened.

Guidelines:

- Regularly monitor the biodiversity status in an internationally comparable way in terms of methods and scope.
- Regularly monitor the status of valuable natural features.
- Upgrade the system for monitoring the status of biodiversity and natural values so as to ensure the assessment of the status, pressures and patterns of change for all plant and animal species covered by the Natura 2000 network.
- Improve and upgrade indicators of the status of biodiversity and valuable natural features.

Information system

The ZRSVN and PA managers collect data on valuable natural features and biodiversity (e.g. data derived from status monitoring and their own fieldwork), and ARSO keeps registers on protected areas, ecologically important areas, valuable natural features and Natura 2000. Data on the occurrence of species and habitat types are generated in monitoring and research, but no information system has been established for them. A comprehensive, publicly available and regularly maintained information system for nature protection has not been established either.

The contents of the register are available to the public on the online spatial viewers of ARSO (Environmental Atlas) and the ZRSVN (Nature Protection Atlas). Spatial data of these contents are publicly available on the ARSO geoportal.

Guideline:

- Establish a comprehensive information system in such a way as to create a national hub of data and information crucial for the implementation and monitoring of the situation and planning of the nature protection policy, which will be publicly available and maintained.

Mapping and evaluation of ecosystems and their services

Ecosystem services provided by conserved biodiversity have an important value for society, which is often overlooked when planning the use of space and natural resources. In accordance with the goals of the EU Biodiversity Strategy until 2020, Slovenia, in cooperation with the European Commission, will continue to map and assess ecosystems and evaluate their services.

Guideline:

- Ensure the mapping and assessment of the status of ecosystems and their services, their economic evaluation and promotion of the consideration of the value of ecosystem services in public accounting systems.

Establishment and maintenance of green infrastructure

Green infrastructure contributes to the maintenance and improvement of the status of biodiversity.

Taking into account the EU Strategy for Green Infrastructure adopted in 2013, Slovenia will continue to establish and maintain its green infrastructure. In this strategy, the Natura 2000 network is defined in the field of nature conservation as the “backbone” of green infrastructure, which means the source areas for the resuscitation of biodiversity and the integration of Natura 2000 sites into a wider functional network is also important.

Slovenia therefore considers the Natura 2000 network as a priority green infrastructure. Important for the complementarity of these areas is the establishment and maintenance of corridors for mobile species, of which large carnivores and amphibians are treated as a priority.

Guideline:

- Responsible, proactive action on land owned by the Republic of Slovenia by continuing targeted action for concrete improvements in agricultural, water and forest areas with systemic and project measures and resources is important for ensuring the good status of species and habitat types within the green infrastructure.

Fulfilment of international obligations

Slovenia is a party to and implements most of international agreements in nature protection, but due to the lack of funds in the period 2005-2013 it mostly lost the acquired position in international organisations in nature protection.

In recent years, several international conventions have been adopted and other forms of cooperation have been established, which, being aware of the goals of the 2030 Agenda, must be taken into account when planning nature conservation activities in Slovenia:

- Strategic Plan for Biodiversity by 2020 with 20 global Aichi Targets,
- the programme of measures of the Third International Conference on Financing for Development from Addis Ababa (Addis Ababa measure programme),
- EU Biodiversity Strategy to 2020,
- Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (hereinafter: the Nagoya Protocol),
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (hereinafter: the IPBES) under the auspices of several UN programmes (UNEP, UNDP, UNESCO in FAO),
- conclusions of the negotiations on a legally binding act on the conservation and sustainable use of marine biodiversity in areas outside state power (Agreement on Biodiversity through Areas of State Jurisdiction; hereinafter: the BBNJ Agreement) taking place under the auspices of the United Nations Convention on the Law of the Sea.

Guidelines:

- Modify regulations due to updated addenda to international agreements: the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (hereinafter: CITES), the Convention on the Conservation of Migratory Species of Wild Animals (hereinafter: the Bonn Convention) and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (hereinafter: AEWA),
- improve the operation of interdepartmental working groups for the implementation of ratified international agreements (CITES, convention governing wetlands of international importance especially as waterfowl habitat (hereinafter: the Ramsar Convention), convention governing the protection of world cultural and natural heritage) and, if necessary, establish new ones (for the implementation of the European Landscape Convention),
- increase Slovenia's contribution to the Global Environment Facility (hereinafter: GEF) and voluntary contributions to funds of ratified international treaties and other forms of cooperation in accordance with its capabilities,
- ratify the Nagoya Protocol and BBNJ agreement after its conclusion, and accede to IPBES.

Funding of NNPP

Taking into account the goals of the adopted global and EU policies on the conservation of biodiversity, priority funding will be given to existing measures and structures for their implementation, which – as well as funding – need to be strengthened in almost all areas. Therefore, the extent of funding will be increased for the following:

- conservation of the European ecological network Natura 2000,
- conservation of biodiversity important for Slovenia that is not covered by Natura 2000,
- management of protected areas,
- protection of valuable natural features and landscape conservation,
- prevention of the spread of invasive non-native species,
- provision of access to genetic resources and equitable sharing of benefits arising from their utilisation,
- education and awareness-raising activities,

- international cooperation,
- monitoring,
- database maintenance,
- evaluation of ecosystem services,
- establishment of green infrastructure also outside protected areas and Natura 2000,
- establishment of nature protection control outside protected areas.

The overall indicative estimate of the needs for funding the above content through the measures listed in Tables 1 and Chapters 10 is between 47 and 53 million euro per year. The envisaged sources of funding are the state budget as a permanent and reliable source of funding, which also includes financial resources from dedicated funds (e.g. climate), and where funds will be provided under several policies (especially environmental, agricultural, forestry, fisheries), municipal budgets, EU programmes and financial instruments, and donor funds and funds from other sources (e.g. the SKZG and SiDG).

Table 1: Programme for the Protection of Plant and Animal Species and their Habitats and Ecosystems, and Programme for the Establishment of Protected Areas and the Restoration of Valuable Natural Features

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
1	1 / 3	Draft and update legislation	Draft legislation for preventing and controlling the introduction and spread of invasive non-native species.	adopted act	MOP, MKGP, MZI	2020
2	1 / 4		Draft a regulation defining the methodology for determining landscape diversity important for biodiversity conservation, and biodiversity mapping.	adopted act	MOP	2020
3	1 / 1		Update the regulation on the red list of endangered species.	adopted act	MOP / ZRSVN	2022
4	1 / 1		Update the regulation on ecologically important areas.	adopted acts	MOP / ZRSVN	2023
5	2 / 16		Amend acts on protected areas.	increased the share of amended acts	ZRSVN / MOP	ongoing task
6	1 / 2	Draft and update programmes and action plans	Update the PUN and other strategies and action plans.	adopted updated PUN and other acts	MOP, MKGP	2020, 2026
7	1 / 3		Draft an operational programme for INNS placed on the national list and the EU list. Draft an action plan for dealing with priority unintentional pathways of introduction and spread.	the share of INNS for which operational programmes are adopted, the share of priority pathways taken into account	MOP / MKGP, ZRSVN, ZZRS, ZGS	2020 and later regular updating
8	2 / 16	Protected area management	Ensure the management of state protected areas where this has not yet been established.	established management	MOP / ZRSVN	ongoing task
9	2 / 16		Draft and implement management plans (MP) in state protected areas.	drafted MPs for all state protected areas with managers	PA managers / MOP, MGRT, MK, MKGP	ongoing task
10	2 / 16		Draft new proposed areas with international protection statuses.	entries for at least three new areas in the register of areas with international status	MOP / ZRSVN	2030
11	2 / 16		Establish the unified management of protected areas.	established unified criteria and common general services (for finance and human resources, supervision, etc.)	MOP	2030

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
12	2 / 17	Establish new protected areas	Identify priority areas for the establishment of protected areas in order to preserve biodiversity, the landscape and valuable natural features, taking into account the interests of key stakeholders (nature conservation NGOs, municipalities).	identified priority areas for the establishment of new protected areas	MOP / ZRSVN	2020
13	2 / 17		Establish new protected areas, especially in valuable natural features of national or international importance that are directly endangered.	increase the share of new protected areas by at least 2% of Slovenia's territory	MOP / ZRSVN	2030
14	2 / 17		Support the establishment of municipal protected areas.	increase the share of municipal protected areas (in connection with priority areas for the establishment of new protected areas)	MOP / ZRSVN	ongoing task
15	2 / 11	Develop guidelines and studies	Refine and upgrade nature protection guidelines.	content about valuable natural features protection included in spatial plans and plans for use of natural assets and considered in the implementation of plans	ZRSVN	ongoing task
16	1/7		Draft a comprehensive study (basis for legal regulation) on interest in genetic resources in Slovenia and on the methods and scope of their utilisation, *ex situ* keeping and sharing the benefits arising from their utilisation.	drafted study	MOP	2022
17	1,2 / 1, 2, 13, 22	Purchase and manage lands	Purchase and manage state-owned lands that: - significantly contribute to the implementation of PUN measures, - are essential to the protection of valuable natural features or their visiting and viewing, - are essential for the management of protected areas.	agreement on the implementation of purchases and management of state-owned land that significantly contributes to the implementation of PUN measures determined priority areas for the target implementation of these measures and targeted purchase	MOP / MKGP, SKZG, SiDG, PA managers, ARSO	ongoing task
18	1,2 / 1, 2, 13, 22	Contractual protection and custody	Provide contractual protection and custody in valuable natural features and other areas under custody and protection, including underground caves with a status of a closed cave and open cave with controlled entry.	regulated contractual protection or custody, primarily in valuable natural features and protected areas where the conservation status is not favourable, in protected areas also for the performance of individual management tasks; regulated custody for underground caves (in the same manner and according to the same method of custody as for other valuable natural features)	MOP / ZRSVN, MKGP, PA managers	ongoing task

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
19	2 / 11, 12	Use of valuable natural features	Improve the regime of general and special use of valuable natural features, including underground caves, in a way that preserves the value-related properties of valuable natural features and their intangible value in the long run.	established rules of general use, granted rights for special use, established regular monitoring of special use	MOP / ZRSVN, PA managers	ongoing task
20	2 / 12		Arrange valuable natural features for harmless visiting and viewing, or provide physical protection of valuable natural features that may be endangered by viewing and visiting. Maintain the infrastructure for visiting and viewing, or provide physical protection.	implemented arrangement of valuable natural features, primarily where, for reasons of protection, it is necessary to guide visitors, limit accessibility or mitigate direct impacts; guaranteed maintenance	MOP / ZRSVN, PA managers	ongoing task
21	2 / 11	Restoration of valuable natural features	Carry out restorations where this is possible and justified due to the properties of natural values (taking into account natural processes).	completed restorations, primarily on the valuable natural features where non-complex restoration measures or activities may have a great positive impact	MOP / ZRSVN, PA managers	ongoing task
22	1 / 3	Invasive non-native species management	Establish and implement a system for monitoring invasive non-native species (INNS), including an information system and continuous monitoring of their occurrence in nature. Establish a system for the early detection of invasive non-native species, quick response and their management.	share of INNS addressed within the system	MOP / MKGP, ARSO, ZRSVN, ZZRS, ZGS, MZI	2022, then ongoing task
23	1/7	Genetic resources	Improve capacities for the practical application of legislation including supervision. Raise awareness of the importance of the Nagoya Protocol and its goal, and establish a clearing-house mechanism and promote the use of best practices and the diligent behaviour of users. Benefits arising from the utilisation of genetic resources and their subsequent use and marketing will be shared with the country providing these resources with the aim of promoting the conservation of biodiversity on a global scale. If necessary, provide legal regulation of the access to genetic resources based on the results of a comprehensive study.	users fulfil their obligations in accordance with the regulation on the access to genetic resources a functioning clearing-house mechanism for the Nagoya protocol a registered collection of genetic resources and best practices established regular supervision and additional supervision based on risk analysis	MOP / MKGP, MZ, MIZŠ, interdepartmental working group	ongoing task
24	1 / 1	Protection of wild pollinators	Establish an active interdepartmental cooperation for the protection of wild pollinators.	programme framework for the implementation of the EU strategy on pollinators in place	MOP, MKGP	2020

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
25	2 / 14	Evaluation of valuable natural features	Upgrade the evaluation of valuable natural features; define the criteria for recording and evaluating landscape values.	defined and upgraded evaluation criteria for all types of valuable natural features	ZRSVN	ongoing task
26	2 / 14		Upgrade the evaluation of valuable natural features, re-evaluate certain types, define the relationship between valuable natural features of living nature and ecologically important areas, regularly monitor the status of valuable natural features.	upgraded data on valuable natural features, especially by defined substantiation by individual types, verified accuracy of geographical data, upgraded and unified criteria for monitoring the status of valuable natural features in nature, and definition of the status in view of different types		
27	1 / 1, 6, 23	Trafficking in endangered species	Raise public awareness to prevent illegal trafficking in endangered and protected species, detect violations and punish violators.	regulated and monitored trade in endangered and protected species	MOP / MNZ, FURS, ARSO, inspections	ongoing task
28	1 / 5	Monitoring	Implement monitoring to the extent enabling the determination of the level of conservation of all species important at the European level, and species and habitat types crucial as indicators of the status (including endemic species).	gradual increase of the scope of monitoring to a level that enables the satisfactory management of Natura 2000 and protected areas and reporting to international institutions	MOP, ZRSVN, ARSO / MKGP	ongoing task
29	2 / 15		Monitor the status of valuable natural features, promptly detect unfavourable impacts and respond adequately.	verified status of valuable natural features in nature, 5–10% annually		
30	1,2 / 20, 3	Information system and databases	Edit, upgrade and regularly maintain: – database on biodiversity, valuable natural features and landscape characteristics important for biodiversity conservation, - a data viewer that enables adequate reviews, searches and transfer of data from the database.	an upgraded, regularly maintained database on biodiversity, valuable natural features and landscape characteristics important for biodiversity conservation (determined and spatially defined on at least half of protected areas) enabling reviews, searches, transfers, overlaps and linking of different data	ARSO, ZRSVN / PA managers, MOP, MKGP	ongoing task
31	1,2 / 20, 3		Establish a system for regular upgrading, updating and maintaining of the database.			ongoing task
32	1,2 / 20, 3		Link geo-referenced data on spatial use and activities (as sources of pressure) with the status of species and habitat types.			2025
33	1,2 / 10	Education	Prepare proposals for supplementing the programmes for primary and secondary schools with basic and applied nature protection content; train teaching personnel.	supplemented programmes at all levels	MIZŠ, ZRSŠ, CPI, MOP, ZRSVN, MKGP, ZGS, KGZS	2020–2025

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
34	1,2 / 10		Integrate basic nature conservation content in teaching/study programmes of professions concerning interventions in nature.	programmes with integrated nature protection content	MIZŠ	2020–2025
35	1,2 / 10		Train employees in jobs concerning interventions with nature.	completed training courses	ZRSVN, PA managers, MIZŠ	2025 and onwards
36	1,2 / 10		Train services working in biodiversity conservation and management of biodiversity components to ensure the high-quality performance of their tasks.	completed training courses	ZRSVN, MOP	ongoing task
37	1, 2 / 21	Awareness raising	Implement regular awareness-raising activities and campaigns for nature conservation and respond to current threats and pressures on nature; also in connection with initiatives at the European and global levels and the use of modern information technologies.	increase the share of the population aware of the threats and/or active in nature protection prepared information for media implemented awareness-raising campaigns in nature protection projects higher share of the population with a positive attitude towards the protection of valuable natural features and knowledge thereof, and awareness of practices detrimental to valuable natural features.	MOP, UKOM, ARSO, ZRSVN, PA managers, ZGS, other departments, NGO's	ongoing task
38	1, 2 / 21		Promote examples of good nature conservation practices where public institutes, especially PA managers, act as role models.	presented examples of good practice	MOP, PA managers, ZRSVN, NGO's	ongoing task
39	1, 2 / 21		Promote awareness-raising activities taking place through direct communication and involving local stakeholders. Promote awareness-raising enabling a change in behaviour in areas where nature is directly threatened by local activities (e.g. recreation).	share of awareness-raising campaigns or NGO projects with participation of local stakeholders; implemented awareness-raising activities in recognised areas where nature is directly threatened by human activities	MOP, ZRSVN, ZGS, PA managers, NGO's	ongoing task
40	1,2 / 18, 19	Inspection and nature protection control	Enforce appropriate, effective and proportionate measures for violations.	a more effective system of penal and dissuasive measures including penalty provisions established	MOP, MKGP, IRSOP, IRSKGLR, FURS, MNZ	ongoing task
41	1,2 / 18, 19		Establish comprehensive direct nature protection control and coordination of providers.	established unit for nature protection control within the MOP, improved cooperation among minor offence authorities	MOP	2021 and onwards

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
42	1,2 / 1, 22, 24	Elimination of adverse incentives	Monitor the effects of subsidies on biodiversity and landscape diversity, and transform or eliminate them where appropriate.	eliminated or transformed adverse economic incentives where appropriate	MOP, MKGP, MZI	2025 and onwards
43	1 / 6	Handling animals of wild species taken from the wild	Analyse the treatment of animals of wild species taken from the wild and take the necessary measures to amend protection regimes and raise standards and other measures to prevent adverse effects on wild species populations.	refined standards and rules for the treatment of animals of wild species taken from the wild for animal welfare and risk reduction for wild species populations	MOP, MKGP	ongoing task
44	1 / 8	Evaluation of ecosystem services	Map ecosystem services on the basis of the existing data and with potential additional mapping of ecosystems. Assess the status of ecosystems and ecosystem services. Evaluate ecosystem services at the national level.	share of ecosystems with determined and evaluated ecosystem services based on their status	MOP / MKGP, SURS	2022 and onwards
45	1,2 / 9	Green infrastructure	Maintain and establish corridors for large carnivores with green bridges in the existing motorway network.	maintained corridors up to two new green bridges in the motorway network	MZI, DARS / MOP, ZRSVN, ZGS	2030 ongoing task
46	1,2 / 9		Provide passages for amphibians at state road sections with the most adverse impact on amphibian populations.	provision of passages for amphibians at key sections of state roads	DRSI, MZI / MOP, ZRSVN, ZGS	
47	1,2 / 9		Create new demonstration examples of achieving nature conservation goals on state-owned agricultural, forest and water land.	at least nine new demonstration examples (three each on agricultural, forest and water land) of achieving nature conservation goals, each on at least 50 ha	MOP, MKGP, SKZG, SiDG, DRSV, ZRSVN, PA managers	
48	1 / 25 - 31	International activities	Make efforts to achieve the more prominent position of Slovenia in the bodies of international organisations. Fulfil contractual obligations and enhance cooperation in decision-making bodies of international agreements. Build capacities for policy management, drafting of positions, representation in international organisations, operation of contact points, coordination, reporting and dissemination of information. Implement the official development aid commitment (0.33% of GDP), which includes contributions to GEF and programmes of ratified international agreements.	regularly settled financial liabilities; updated amendments to international agreements (CITES, the Bonn Convention and the AEWA) transposed into the domestic legal order; ratification of the Nagoya Protocol and the BBNJ Agreement; Slovenia's accession to IPBES; an increased contribution by Slovenia to the GEF and voluntary contributions to the funds of ratified international treaties; increased membership in decision-making bodies at the UN level	MOP / MZZ	ongoing task

Measure No.	Goal / specific goal	Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
			Advocate greater effectiveness of international agreements (reduction of administrative burdens, harmonisation of cycles, compliance with the mandate of the parties, transparency and professionalism in decision-making processes). Effective management of EU Council working groups and coordination and representation of the EU in bodies of international organisations during the Presidency of the EU Council (2021).			

The implementation of the Programme for the Protection of Plant and Animal Species and their Habitats and Ecosystems, and the Programme for the Establishment of Protected Areas and the Restoration of Valuable Natural Features will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

5.2. Soil

Current situation and challenges

From the point of view of human civilisation, soil is a non-renewable natural resource, as its creation and restoration takes tens of millennia. The provision of ecosystem services makes soil vital for people and the environment. Soil provides the following ecosystem services:

- being a foundation for the supply of food, fodder, biomass and raw materials,
- permeating and purifying precipitation, thus supplying groundwater, which is the main source of drinking water in Slovenia,
- retaining, filtering and neutralising pollutants,
- contributing to the management of pests and transmission of diseases,
- binding atmospheric carbon to the soil's organic matter,
- acting as a GHG sink and enabling carbon circulation,
- participating in nutrient circulation processes,
- contributing to flood mitigation,
- providing a basis for terrestrial ecosystem diversity and biodiversity,
- providing a living space for people and other organisms,
- shaping the landscape and being an archive of natural and cultural heritage,
- being a foundation for various human activities and the satisfaction of vital and cultural human needs.

The role of soil in terrestrial ecosystems is significantly greater than has been recognised so far, therefore soil needs to be protected and, above all, managed sustainably in such a way as to preserve its diversity, quality and ability to provide ecosystem services.

The key is to manage soil development processes, which can also involve degradation. Degradation processes reduce the capacity to ensure key ecosystem services of soil, which in turn produces an adverse effect on the economy and the development opportunities of the entire society. Some degradation processes in Slovenia have not been detected to such an extent that would pose an immediate threat to this natural resource. In most parts of Slovenia, agricultural soil is properly supplied with organic matter, which is why soil acidification and, above all, salinisation is not detected to occur to such an extent as to be classified as important soil degradation processes. Desertification has also not been detected. The soil of individual parts of Slovenia is endangered by inorganic pollutants (particularly metals and metalloids, such as cadmium, lead, zinc, arsenic, copper) and organic pollutants from industry and transport (for example, polychlorinated biphenyls, polycyclic aromatic hydrocarbons and mineral oils) and farming (e.g. pesticide residue) along with soil erosion. The 2019 assessment of the European Commission on the implementation of environmental laws and policies in Slovenia shows that the RUSLE 2015 model data for Slovenia revealed that annual soil degradation due to water erosion on agricultural land in Slovenia is above the European average.

The greatest threat to soil in Slovenia and in Europe is covering the soil with various impermeable materials (e.g. asphalt, concrete) and ground consolidation or land compaction.

Therefore, sustainable soil management, including sustainable land management and the rehabilitation and revitalisation of degraded soil areas, remains a key and integral part of ensuring sustainable development, in particular in the sense of adopting a comprehensive approach to the rehabilitation of degraded areas.

Unsustainable soil management threatens the implementation of soil ecosystem services also in Slovenia. Unsustainable soil management threatens soil fertility (especially by reducing or not preserving organic matter in the soil and reducing the nutrient content) and causes soil erosion, which affects the country's food security, reduces biodiversity and the possibility of water filtration on its way to drinking water sources. A key role in maintaining good soil quality is played by forestry and agriculture, which are the activities carried out on the largest part of Slovenia's soil and where a system of monitoring soil fertility on agricultural land has not yet been established.

Unsustainable soil management, together with unsustainable spatial planning, may cause a permanent loss of soil as a natural source due to pollution, soil sealing and land compaction. High-quality soil should be preserved by preventing these processes to the greatest extent possible and rehabilitating or revitalising the areas with polluted soil. The key role in this is played by a comprehensive approach in the process of spatial planning at all levels, which considers soil as a limited natural resource and the foundation for the provision of key ecosystem services. Maintaining high-quality agricultural land results in, in particular, food supply opportunities, while efficient spatial management in urban areas provides high-quality living and working space. It should be borne in mind that the soil on agricultural land, in addition to food supply and related nutritional independence of Slovenia and human and animal health, is important for the implementation of other ecosystem services, including biodiversity, atmospheric carbon sink and GHG sink, the retention, filtration and neutralisation of pollutants and the purification of rainwater.

The key to ensuring sustainable soil management is monitoring of soil status with the aim of providing data and information to enable timely action or for the appropriate organisation of land use and activities so as to minimise the negative impacts and effects on soil and the environment. Target and sector-tailored data and information on soils and their characteristics, as well as information on all forms of degradation processes in Slovenia should be prepared, both with quantified data and map displays.

Such data and information are necessary for land use planning and activities where their suitability must be carefully assessed and compromises sought from the aspect of providing soil ecosystem services, with priority given to the land use or activity that can preserve or provide as many ecosystem services as possible.

Awareness of the importance of soil and ecosystem services provided by this natural resource needs to be raised. To this end, knowledge of soil and awareness of its importance in the environment and society must be comprehensively upgraded.

Soil protection goals

Soil protection measures will achieve the following goals:

1. an increased capacity to provide soil ecosystem services:
   - by controlling degradation processes related to the reduction of soil's organic matter, by soil erosion control, by soil pollution prevention, and the rehabilitation and revitalisation of degraded areas,
   - by sustainable soil and land management and reduced net annual growth of built-up land by 25% by 2030 and with the goal of zero growth of built-up land from 2050 onwards (the net annual growth of built-up land is an increase in built-up land in one year calculated by the following formula: the net growth of area of built-up land = area of built-up land in the year n –area of built-up land in the year n–1. Built-up areas are areas on the ground comprising the following: building plots of buildings, the associated land of buildings, the associated land of public roads and railway infrastructure, the associated land of other civil engineering works;
2. enhanced data and information on the soil status;

3. an increased awareness of the significance of soil.

Guidelines and measures for achieving the soil protection goals

Slovenia will upgrade the protection and sustainable management of soil as natural capital in its efforts to provide and maintain its ecosystem services, where sustainable use, protection, conservation and improvement of this natural capital are focused on land and soil. In terms of type of soil degradation in the country, Slovenia needs to achieve especially the following:

- step up efforts to reduce covering the soil with impermeable materials (soil sealing),
- conservation and increase of the quantity of the soil's organic matter in agricultural areas with a detected shortage,
- reduction of soil erosion, where relevant, and related losses or displacements, in particular of fertile parts of the soil,
- protection, conservation and improvement of biodiversity in and on soil,
- soil pollution prevention,
- rehabilitation and revitalisation of soil in polluted areas,
- integration of different aspects of soil use and protection in decision-making procedures at all levels and in different sectors, and
- gradual reduction in net annual growth of built-up land with the aim of zero growth from 2050 onwards.

It is also necessary to ensure proper handling of unpolluted fertile topsoil (upper soil horizon) that is permanently or temporarily removed from the land due to construction or other spatial interventions (e.g. land levelling) in order to check its quality and ensure appropriate temporary disposal of this part of soil for reuse. There is a need to improve the control of traffic and the continued use of this part of the soil.

It is also necessary to ensure the supervision of traffic and the continued use of part of the soil or earths that is not the upper fertile part of the soil (lower soil horizons) and are not excessively contaminated.

For excessively contaminated soils or earths, temporary disposal areas must be provided for cases where excessively contaminated soil or earths cannot be remediated immediately and on-site and must therefore be safely moved to an appropriate area until remediation and further use or transport to its possible destruction.

Desertification, acidification and salinisation are not priority challenges for the soil in Slovenia, so measures related to these phenomena are not defined.

Detailed guidelines and measures for achieving the soil protection goals are presented in Table 2.

Table 2: Soil protection measures

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Land management	Priority rehabilitation of soil in degraded building land and reuse of this land.	area of degraded building land where soil is rehabilitated and lands reused	MOP	ongoing task
	Return land not built on, already intended for building, for agricultural and forestry use, where appropriate.	share of returned land	MOP, municipalities	ongoing task
	Improve land policy for activation of building land which has not been built on with the aim of reducing the net annual growth of built-up land area.	net annual growth of the built-up land area	MOP, municipalities	ongoing task
	Establish a cross-sectoral information service for data and information about the actual use of lands.	information system established	MOP	2020 and onwards
Legislative drafting	Amend regulations in spatial management and construction with the aim of including underground space management.	adopted and amended regulations	MOP	2022
	Amend regulations in the comprehensive assessment of environmental impact with the aim of enhancing the addressing of soil protection issues.		MOP	2020
Monitoring, data and databases on soil condition	Establish and implement soil status monitoring from the aspect of its contamination: 1. establish a national network for monitoring and implement the monitoring, 2. establish a cross-sectoral information service for data and information about the soil status from the aspect of their contamination and patterns of change (trends).	monitoring established	MOP-ARSO	2021
	Preparation of legal bases, establishment and implementation of monitoring of the soil's organic matter and nutrients: 1. determination of obligations, manner and frequency of monitoring and reporting on the state of the soil's organic matter on agricultural and forest land in Slovenia for the purpose of establishing GHG emission records; 2. determination of obligations, manner and frequency of monitoring and reporting on the state organic matter and nutrients in soil on agricultural land, 3. establishment of a cross-sectoral information service for data and information about the status of organic matter and nutrients in soil and patterns of change.	monitoring established	MKGP	2020 and onwards

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
	Drafting legal bases, establishment and monitoring of soil erosion in agricultural land: 1. determination of obligations, manner and frequency of monitoring and reporting on the state of soil erosion on agricultural land, 2. establishment of a cross-sectoral information service for data and information about the state of soil erosion on agricultural land and patterns of change.	monitoring of soil erosion on agricultural land established	MKGP	2021
	Establishment and maintenance of the databases on the following: 1. areas potentially at risk due to soil pollution, 2. biodiversity in soil in connection with the conservation of endangered species and habitat types.	database established and maintained	MOP, ARSO	2020/2022 (establishment), then ongoing task
Management of soil/earths	Make efforts to ensure the environmentally sustainable use of plant protection products, fertilisers and agricultural techniques (prepare legal bases, upgrade already established ones and prepare or upgrade professional instructions).	an improved condition of waters and soil	MKGP	ongoing task
	Make efforts to ensure soil-friendly use of machinery in forests in forest management plans, and raise awareness.	drafted guidelines and implemented awareness-raising activities	MKGP, ZGS	ongoing task
	Examine the adequacy of the introduction of new measures (legislative, financial, supervisory) for an improved earth relocation system and introduce such measures.	developed analysis and introduced measures	MOP, ARSO / MKGP	2022
	Make efforts to provide areas for the temporary disposal of removed non-contaminated earth.	areas determined in spatial planning documents	MOP	2023
	Make efforts to provide areas for the temporary disposal of removed contaminated earth.		MOP	2023
	Improve the inspection of relocation of earths.		MOP	ongoing task
Awareness raising	Organise education workshops and research camps for young people, make brochures and prepare online information.	number of events	MOP, MKGP	ongoing task
Stakeholder integration	The work of the Slovenian Soil Partnership.	activities of the Partnership	MOP / Partnership members	ongoing task

The implementation of soil protection measures will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

5.3 Air

Current situation and challenges

Air quality is an important environmental condition factor because the impact of polluted air on human health and well-being is greater than other environmental impacts. It is a health hazard that is virtually unavoidable. Due to polluted air, especially due to elevated particulate matter levels in Slovenia, the country records 2,000 premature deaths annually and the life of its people is, on average, almost a year shorter. Polluted air also has a detrimental effect on ecosystems, reduces agricultural yields and causes damage to buildings, cultural heritage and installations. Health-related external costs in Slovenia annually amount to a billion euro.

Decades ago, the biggest problem in Slovenia was the extremely high levels of sulphur dioxide, which exceeded the currently valid limit values by more than an order of magnitude. After the measures taken in thermal power plants and industry and the introduction of low-sulphur fuels in transport and households in Slovenia, there are no longer problems with sulphur dioxide – the current challenge is excessive levels of PM_{10} and ground-level ozone and the increasing pollution with benzo(a)pyrene (BaP).

In terms of particulate matter, Slovenia ranks among the countries of the European Union with more polluted air and is among the leading countries in terms of emissions of particulate matter per capita and also per unit area, as well as in terms of pollution with ozone and benzo(a)pyrene.

In addition to the primary particulate matter resulting from the direct emission of dust into the air (e.g. from the diesel vehicles exhaust, from chimneys from burning wood, coal, etc.), secondary particulate matter is also formed as a result of chemical reactions between its precursors (nitrogen oxides (NO_x), sulphur dioxide (SO_2), ammonia (NH_3) and non-methane volatile organic compounds (NMVOC)). Secondary pollutants include ozone as well as particulate matter deposited on surfaces and re-suspended in the air as a consequence of traffic or wind. In order to reduce pollution by particulate matter, it is therefore also necessary to reduce emissions of secondary pollutant precursors.

High specific emissions of particulate matter in Slovenia are mainly the result of the widespread use of wood in outdated home-heating appliances, which is the source of as much as two-thirds of emissions of particulate matter. Elevated air particulate matter levels are additionally affected by unfavourable weather conditions in poorly ventilated basins and valleys of the continental part of Slovenia, where temperature inversions are frequent and intense. In such conditions, even a small density of emissions can cause excessive air pollution. After 2010, the permissible number of exceedances of the daily limit value for PM_{10} particles was exceeded at almost all permanent measuring points in urban environments. Exceedances of the permissible number of daily limit values have not been recorded in the Primorska region, where average wind speed is higher than in the continental part of Slovenia. Pollution by particulate matter in Slovenia is the result of local emissions and the transfer of pollutants on a regional scale.

Pollution by ground-level ozone is, contrary to pollution by particulate matter, of a markedly regional character with the decisive influence of cross-border transition of pollution. The permissible number of exceedances of the target maximum eight-hour concentration for health protection has been exceeded at almost all measuring points in recent years. The only exceptions is measuring points under the direct influence of traffic emissions, where the reaction of ozone with nitrogen oxides reduces ozone levels in a limited area. Ozone levels occasionally exceed the action value. Critical values for vegetation are also exceeded at

representative measuring points for vegetation protection. Ozone pollution is highest in the Primorska region, which is more influenced by the cross-border passage of ozone and its precursors and has more favourable meteorological conditions for ozone formation.

Air pollution by benzo(a)pyrene slightly increased in the 2008–2015 period and is above the target value at exposed measuring points. The main source is emissions from outdated small solid-fuel home-heating appliances (especially fuelled by wood), which are characterised by poorer combustion and poor energy efficiency, and as a result by high levels of emissions of particulate matter and organic compounds. Another important source of benzo(a)pyrene is transport, especially diesel-fuelled vehicles.

Heavy metal levels in Slovenia are low, with the exception of the Upper Mežica Valley. Lead levels there are slightly below the limit value, while the exceeded target value for cadmium was recorded for the first time in 2016. The cause of the measured elevated levels is lead processing in the area in the past and present.

Goals of maintaining and improving air quality

Measures for maintaining and improving air quality will achieve the following goals:

1. air quality will comply with pollutant limit values and will gradually approach the WHO recommendations on pollutant levels;
2. by 2030, the emissions of the following substances will be lower in comparison with 2005:
   - nitrogen oxides NO_X: by 65%,
   - non-methane volatile organic compounds NMVOC: by 53%,
   - sulphur dioxide SO_2: by 92%,
   - ammonia NH_3: by 15%,
   - particulate matter $PM_{2,5}$: by 60 %.

Guidelines and measures for maintaining and improving air quality

Improvement of ambient air quality

Measures for improving air quality will be in accordance with the goals and approaches harmonised at the EU level with the directive governing air quality and the directive governing arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

Priority will be given to measures to control the pollution by PM_{10} and $PM_{2.5}$, ground-level ozone and benzo(a)pyrene (BaP), and heavy metal pollution in the Upper Mežica Valley.

Measures to improve air quality will cover the entire territory of the country and will be complemented by measures to control exceeded limit values of pollutants in individual areas.

An operational programme for maintaining the best ambient air quality in Slovenia will be drafted for air quality management at the national level. Reduction of emissions of pollutants will also be coordinated and integrated into the sectoral policies of energy, transport, spatial planning and sustainable urban development, as well as agriculture and climate change mitigation. These measures will be aimed primarily at reducing emissions of particulate matter and its precursors, which are the most problematic in Slovenia, and will also address emissions of other pollutants. The implementation of the operational programme will ensure the maintenance and improvement of air quality in areas where air quality complies with the limit values. In addition, the implementation of the plan will also help

to reduce the regional pollution background and thus to reduce the pollution of over-polluted areas. The operational programme will also include measures to reduce the level of ozone, which is a problem of wider regional and continental dimensions and cannot be solved only by reducing emissions of ozone precursors in Slovenia.

Air quality plans will be implemented in areas where measurements have detected exceeded limit values. The purpose of these plans is to ensure compliance with the limit values as soon as possible through supplementing measures implemented in addition to the nation-wide measures. Air quality plans are prepared by the Government in cooperation with local communities. Seven plans were adopted in 2013 and amended in 2017 and 2018. All of them are aimed at achieving compliance with the limit values for particulate matter, which will remain a priority of the plans in the future, given the characteristics of the situation in Slovenia. It can be expected, however, that new areas will be identified where the assessment of air quality will show non-compliance with the limit values.

Air quality plans will continue to be based primarily on energy efficiency measures, renewable energy sources and sustainable mobility. As they concern mostly urban areas, the orientations of the plans will be an important component of sustainable urban development in the field of mobility as well as in the field of energy and spatial planning. Coordinated planning of measures and developments in these areas and the implementation of measures with combined effects for energy efficiency, sustainable mobility and environmental protection will be crucial.

Controlling the emissions of particulate matter and other carcinogenic air pollutants (e.g. benzo(a)pyrene and dioxins) due to the energy use of wood while taking into account economic, social, energy and other environmental aspects is one of the central challenges of air protection in Slovenia to be addressed by the Strategy for the Smart Use of Wood Biomass in Combustion Plants. It will take into account different aspects of the use of wood biomass typical of Slovenia. Traditionally, wood in Slovenia is used as an energy source mainly for heating households; half of the final energy for household heating is provided by wood biomass today. The energy use of wood has an important economic and social aspect, contributes to greater energy independence of the country and increases the share of renewable sources in the energy balance. Wood is considered a carbon-neutral fuel and largely replaces fossil fuels, a source of greenhouse gases, which helps to achieve climate goals, but also causes poorer air quality due to emissions of particulate matter and other carcinogenic pollutants. From the aspect of planning measures, it is important that as much as two-thirds of all particulate matter emissions in Slovenia are the result of wood burning mostly in outdated home-heating appliances.

In a post-industrial society, air pollution is increasingly influenced by the choices and activities of individuals. This is particularly evident in particulate matter air pollution, where the greatest impacts on air quality are the result of heating of buildings and motorised transport. Systemic measures to reduce the use of energy for heating, to modernise the rolling stock and to use more environmentally friendly modes of transport will devote more attention to the provision of information and awareness-raising. Provision of information and awareness-raising will cover the promotion of the more appropriate use of heating appliances and economic driving, cycling and walking. This makes it possible to reduce pollution without investments, and at the same time save money due to lower fuel consumption.

Monitoring the effectiveness of measures to improve air quality and their updating requires an upgraded knowledge and understanding of pollutant discharges, their spread and consequences in the atmosphere. The spatial density of air quality data also needs to be improved through additional measurements and the use of models.

Limiting emissions of ambient air pollutants to reduce regional air pollution and cross-border pollution

In order to reduce regional and cross-border pollution, Slovenia will take measures to reduce emissions of ambient air pollutants in accordance with international obligations from the revised Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level ozone (hereinafter: the Gothenburg Protocol) and the new directive setting national emission reduction commitments for certain air pollutants (hereinafter: the NEC Directive). Both provisions also introduce the ceiling for $PM_{2.5}$ particles. The Gothenburg Protocol introduces relative emission ceilings for 2020, and the new NEC Directive introduces relative emission ceilings for 2020, 2025 and 2030.

Table 3: Emission reduction commitments for certain air pollutants (the target for 2025 will be set by a linear reduction curve between the 2020 and 2030 commitments).

	National emission ceilings for certain air pollutants (in kilotons)	**National obligations to reduce emissions for certain air pollutants (in comparison to 2005)**	
	2010–2019	2020	2030
nitrogen oxides (NOx)	45 kt	- 39%	- 65%
non-methane volatile organic compounds NMV(	40 kt	- 23%	- 53%
sulphur dioxide (SO2)	27 kt	- 63%	- 92 %
ammonia (NH_3)	20 kt	- 1 %	- 15%
particulate matter ($PM_{2.5}$)	-	- 25%	- 60%

The projections of air pollutant emissions by 2030, taking into account current measures including the OP-GHG-2020 measures, show that emissions will be further reduced. However, given the delays in the implementation of the OP-GHG-2020, the bases of these projections are sometimes overly optimistic.

The projections of SO_2 emissions by 2030 show a 92% reduction, with the power and heat generation sector contributing the most to the reduction. The projections of NO_x emissions show a 66% reduction; the reduction is greatest in the transport sector, followed by power and heat generation sector. The projections of NH_3 emissions by 2030 suggest that they will be reduced more than is necessary to achieve the target reduction. The projections therefore show the achievement of the 2030 emission reduction target for SO_2, NO_x and NH_3. The projections, however, do not show the achievement of the target reduction of NMVOC and $PM_{2.5}$ emissions: NMVOC emissions will be, namely, reduced by 45% and $PM_{2.5}$ emissions by 49%, which is 8 and 11 percentage points less than the target reduction by 2030. Achieving the 2020 target, when emissions should be 25% lower than in 2005, is also problematic for $PM_{2.5}$ emissions. If the measures included in climate change mitigation programmes and other policy programmes continue, taking into account environmental regulations on emission limit values and other regulations, achieving the 2030 targets is realistically achievable for NO_x, SO_2 and NH_3. However, in addition to the current measures, additional measures will be needed to achieve the target reduction of $PM_{2.5}$ and NMVOC emissions.

Additional measures to achieve the targets for pollutant emissions will be specified in more detail in the amended Operational Programme for Air Pollution Control, which will be prepared in 2020.

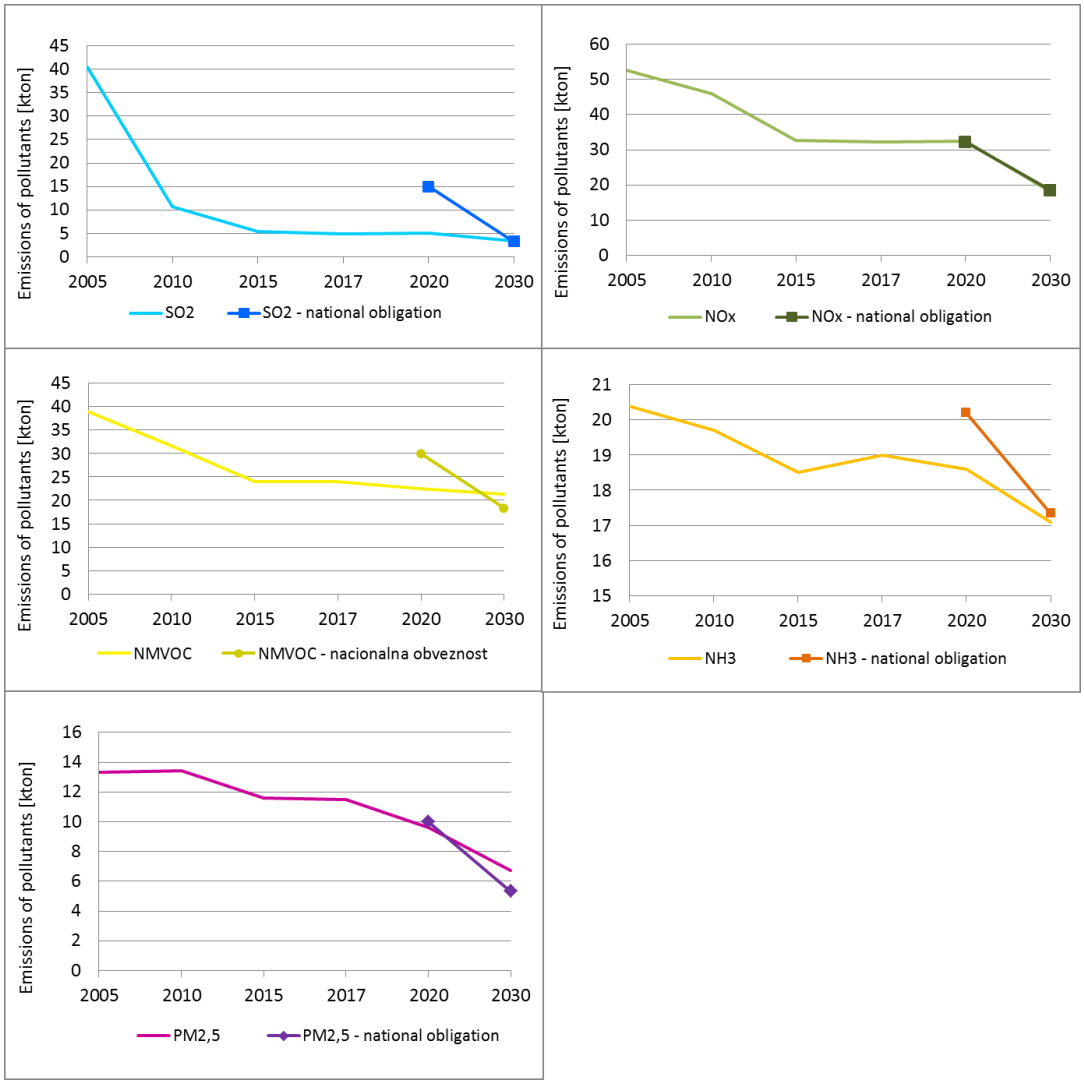

Figure 5: Emissions and projected emissions of pollutants and comparison with the emission reduction commitments by 2030.
Source: Operational Programme for Air Pollution Control (OPNOZ), 2019.

Measures of other policies, in particular climate, transport, energy and agricultural policy, will also contribute to achieving the targets for ambient air quality and reducing emissions of ambient air pollutants. The process of planning and implementing these policies will have to pay more attention to measures that are also beneficial for the protection of ambient air, and avoid unilateral moves with adverse effects on the achievement of targets for pollutant emission limit values or air quality. In particular, it will be necessary to ensure that climate change mitigation and air quality improvement measures focus on solutions that benefit both areas.

Table 4: Measures for maintaining and improving air quality

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Drafting plans with detailed measures	Draft the Operational Programme for Maintaining the Best Ambient Air Quality in Slovenia.	drafted programme	MOP	2022
	Amend plans for air quality in areas with exceeded limit values, and implement measures set in plans.	amended plans	MOP	ongoing task
	Draft the Strategy of Smart Use of Wood Biomass in Combustion Plants.	drafted strategy	MOP	2021
	Amend the Operational Programme for Air Pollution Control.	drafted programme	MOP	2020
Provision of information and raising awareness	Carry out the provision of information and raising awareness activities.	number of activities	MOP	ongoing task

The implementation of the measures for maintaining and improving air quality will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

5.4 Waters – National Water Management Programme

In accordance with the Waters Act, the National Water Management Strategy (hereinafter: the NPUV) is the basic strategic document determining the national water management policy.

The goal of the NPUV is the general improvement of the aquatic environment and the protection of water sources.

Besides internal interests, the NPUV takes into account Slovenia's commitments based on adopted international and regional treaties, conventions and agreements and concluded bilateral agreements in the field of waters.

It is based on the precautionary principle, the principle of preventive action and the elimination of pollution at the source and the principle of the liability of the polluter, and contributes to a high level of water protection and the better quality of life and well-being of citizens.

Water management in Slovenia's legal system is regulated by regulations in the field of waters and the environment in a manner comparable to Europe, and comprehensively addresses water protection, use and regulation.

Goals and guidelines for water protection, management and sustainable use in Slovenia are drafted in accordance with general principles and basic guidelines of the global water management policy and general principles and basic orientation of the EU environmental policy in water management.

The systemic regulation of water management in Slovenia is in accordance with European legal acts, strategies and guidelines in the field of waters and the environment, which regulate the water policy, quality standards in the water policy, groundwater protection, flood risk, marine environmental policy measures, quality of water intended for human consumption, municipal water treatment, industrial emissions, the placing of plant protection products on the market, the protection of waters against nitrate pollution from agricultural sources and bathing water quality management.

The basis for water management determined by Slovenia's legislation is territorial bases, institutional organisation, quality standards, instruments and basic documents for the implementation of regulations determined by regulations, as well as financial resources. Territorial bases of management in Slovenia are based on naturally occurring hydrographic boundaries of river basins and sub-basins and define as the basic territorial-administrative division two catchment areas: the Danube catchment area, which is divided into the Mura, Drava and Sava river basins, and the Adriatic Sea catchment area divided into the Soča river basin and the Adriatic river basin with the sea. Both catchment areas are a part of international basins, which means that common international goals should be taken into account in designing internal goals.

Slovenia formulates and coordinates international goals in the democratic process of negotiating on the basis of bilateral and international treaties signed with all neighbouring countries and countries with which it shares international river basins. In line with this, joint working bodies have been set up to coordinate the joint management, use and protection of waters.

In order to achieve water management goals, it will be crucial to intensify the integration of protection and sustainable water management in the areas of other policies,

such as: local and regional development, energy, transport, agriculture, fisheries and tourism policy.

5.4.1 Water protection and use

Current situation and challenges

Current situation and challenges for the Danube and Adriatic Sea catchment areas

The state of surface waters in Slovenia is improving; in general, surface waters are not polluted by priority or priority hazardous substances. A favourable chemical status is defined for almost 96% of surface water bodies, while a poor chemical status is indicated for five marine water bodies due to tributyltin compounds.The ecological status of 59% of surface water bodies is assessed as favourable. For water bodies that do not achieve a favourable ecological status, the most extensive load is hydro-morphological change along with general degradation, nutrient and organic matter load. The main sources of nutrient and organic matter pollution of watercourses are leaching from agricultural land and discharges of municipal and industrial wastewater.

A particular challenge is the poor chemical status in terms of mercury content in organisms in most surface waters. The problem of mercury in the environment cannot be fully solved at the national level, as mercury is transported over long distances by atmospheric deposition and measures must be taken at the European level to reduce the mercury load.

The assessment of the chemical status of groundwater shows that intensive human activity is burdening water bodies the most in the Savinja, Drava and Mura basins. The cause of the poor chemical status of these water bodies is nitrate and, in the Drava Basin, also atrazine. All groundwater bodies have now been assessed to have a good quantitative status , but risks have also been identified – especially for water bodies in north-eastern Slovenia – regarding the maintenance of such a status.

As regards special-purpose areas or waters:

- 17% of the territory in Slovenia is already protected for the purpose of public drinking water supply (so-called water protection areas), but activities for the protection of additional water protection areas will have to be strengthened and accelerated in the future,
- the quality of bathing waters is adequate in all locations intended for bathing,
- the water quality for freshwater fish species is adequate in 21 sections out of a total of 22 surface water sections.

Pollution from point sources and diffuse pollution still threaten the status of waters in Slovenia despite the progress achieved in the framework of legislation on nitrates, wastewater treatment, control of industrial emissions, priority substances and pesticides.

Water pollution occurs due to the input of untreated municipal wastewater from settlement areas or from urban wastewater treatment plants or due to agricultural activity, which significantly burdens the environment in certain areas. Although nitrogen and phosphorus inputs into the environment have decreased significantly over the last 20 years, excessive nutrient releases continue to affect air and water quality and damage ecosystems, causing people to have significant health problems. Nitrate pollution from agricultural production is one of the key reasons for the failure to achieve a favourable groundwater chemical status. Although the content of pesticides in groundwater is declining, the use of

pesticides still has a detrimental effect on the status of surface waters and groundwater, aquatic organisms and amphibians.

Hydromorphological pressures on surface waters are most affected by water abstractions, wastewater discharges, transverse structures, overflow reducers, alluvial abstraction, drainage systems, riverbed regulation and other arrangements, land use in the riparian zone and changes in lake and seashores. In addition to point and diffuse pollution, hydromorphological pressures are one of the key reasons for not achieving a favourable ecological and chemical status of waters and one of the key challenges in water protection, so this issue will need special attention in the future.

Slovenia recognises high-quality water as a precious natural asset. Water consumption has a relatively small share of gross outflow from the country on an annual basis, but special water use must be carried out so as to ensure efficient and effective use of water using the best available techniques. The promotion of sustainable water use that enables different types of use, taking into account the long-term protection of available resources and their quality, thus remains one of the key challenges in water use also in the future. The effective implementation of financial mechanisms, especially in water pricing policy, will be one of the key future challenges for achieving the goals in this area.

Current situation and challenges in the marine environment

In Slovenia, special attention must be paid to the marine environment, as this is a valuable heritage that must be protected, preserved and – where possible – restored in order to conserve biodiversity and ensure diverse, dynamic, clean, healthy and productive oceans and seas. The seas and oceans are an immense wealth of biodiversity and are key to maintaining the stable climate of our planet. They are also a source of food and energy and enable the development of marine-related activities.

Activities related to the marine environment contribute 2% of the total added value in Slovenia and provide jobs to 2% of employed persons and bring many important social benefits. These activities have an effect on the balance of the marine environment, and data show that this natural resource is being used beyond the ecosystems' natural restoration ability. This leads to a loss of species and habitats as well as a decrease in the economic efficiency of activities related to the marine environment. A detailed examination shows the following:

- despite the marine environment biodiversity being relatively large, its status is already declining, particularly due to the deterioration of habitats and species as a result of human offshore activities,
- the Slovenian sea has yet to show signs of an excessive occurrence of invasive non-native species, but this has happened in the Adriatic Sea sub-region and the Mediterranean Sea region, which may also bring about changes in the Slovenian sea in the future,
- the situation regarding economically significant marine species is bad due to overfishing, which is mostly a consequence of intensive fishing in the Mediterranean sea region and the Adriatic Sea sub-region,
- the level of eutrophication in the Slovenian sea is not alarming, but is still occurring in places,
- the marine environment is still loaded by pollutants, particularly due to tributyltin compounds and mercury,
- waste causes a burden for the marine environment,
- the environmental impact of underwater noise on the marine environment is at a level that can already have a direct bearing on the behaviour of marine organisms.

Goals in water protection and use

Measures in water protection and use will achieve the following goals by 2030:

1. in water protection and use:
   - favourable chemical and ecological status of all surface water bodies and prevention of deterioration of all surface water bodies,
   - good ecological potential and favourable chemical status for all artificial and heavily modified surface water bodies,
   - favourable chemical and quantitative status of groundwater,
   - prevention of further deterioration of aquatic ecosystems and protection and improvement of the status of ecosystems dependent on surface and groundwater,
   - gradual decrease in pollution from priority substances and the halting or gradual elimination of emissions, discharge and leakage of priority hazardous substances,
   - changes in all significant and continuous increases in the concentration of any pollutant resulting from the impact of human activity in order to gradually reduce groundwater pollution,
   - sustainable water use that enables different types of use, taking into account the long-term protection of available resources and their quality,
   - programming, planning and implementation of water use in a way that does not aggravate the status of waters, to provide protection against harmful effects of water, the preservation of natural processes and natural balance of aquatic and riparian ecosystems,
   - protection, improvement and renewal of groundwater bodies and ensuring a balance between the abstraction and restoration of groundwater,
   - implementation of the principle “polluter pays the costs caused by the pollution of the environment” and “user pays for the use of a natural resource”,
   - international harmonisation in river basins where water management may have cross-border effects;
2. in marine environment protection:
   - improve and/or maintain the good status of the marine environment in terms of biodiversity, which means that the quality and presence of habitats and the distribution and abundance of species are in line with the prevailing physiographic, geographical and climatic conditions,
   - maintain the presence of invasive alien species resulting from human activities at a level that does not harm ecosystems,
   - ensure that populations of all species of fish and shellfish used for commercial purposes are within safe biological limits and have an age distribution typical of a healthy stock,
   - improve and/or maintain a favourable status of the marine environment in relation to food webs, which means that all elements of marine food webs are known to be present in normal quantities and are normally diverse and at numerical levels that can ensure long-term species abundance and conservation of their full reproductive capacity,
   - improve and/or maintain a favourable status of the marine environment in terms of nutrient enrichment so that eutrophication due to human activities does not grow so as to cause adverse effects (biodiversity loss, ecosystem degradation, harmful algal blooms and a lack of oxygen in the lower water layers),
   - maintain the state of the seabed at a level ensuring the protection of the structure and functions of ecosystems and preventing adverse effects, in particular on benthic ecosystems,
   - changes in hydrographic conditions cause no or minimum changes of ecological conditions (they do not cause a decline in biodiversity, habitat degradation, harmful algal blooms and lack of oxygen in the bottom layer),
   - pollutant concentrations are at levels without a detrimental effect on organisms, populations, communities or ecosystems,
   - pollutant concentrations in fish and shells intended for human consumption do not exceed limit values,

- the presence of marine litter does not have an adverse effect on the marine environment,
- the underwater noise level does not have an adverse effect on the marine environment.

Guidelines and measures for achieving the goals in water protection and use

To achieve the NPUV goals, measures will be implemented in accordance with the Water Act as identified in the valid plans of managing catchment areas of the Danube and Adriatic Sea, flood risk reduction plans, marine environment management plans and operational programmes of drinking water supply and urban wastewater discharge and treatment.

The improvement of the marine environment status requires the following steps:

1. improve cross-sectoral cooperation for sustainable marine environment management with the following goals:
   - prevent damage to the seabed and thus to benthic habitats due to anchoring during sea fishing, recreational fishing and maritime transport, as well as recreational navigation,
   - prevent the occurrence of eutrophication and the level of pollutants in the marine environment, which may result from mariculture, maritime transport and recreational navigation activities, the expansion of urban centres on the coast and the expansion of agricultural land in the hinterland,
   - reduce the input of waste into the marine environment resulting from activities in maritime transport, sea fishing and mariculture, coastal tourism and settlements,
   - reduce underwater noise levels resulting from activities in ports, marinas and maritime transport, recreational navigation and construction interventions in coastal waters;
2. with regional and sub-regional cooperation:
   - limit the occurrence of invasive non-native species in the Mediterranean region and the Adriatic sub-region resulting from maritime transport (ballast water input, “stowaways”), mariculture and unintentional inputs,
   - prevent the occurrence of eutrophication and the level of pollutants in the marine environment, which may result from cross-border mariculture, maritime transport and recreational navigation activities, the expansion of urban centres on the coast and the expansion of agricultural land in the hinterland as a result of inputs of nutrients and pollutants by the outflow of the Soča and Po rivers,
   - reduce the input of marine litter into the marine environment resulting from cross-border activities in maritime transport, sea fishing and mariculture, coastal tourism and settlements, and their input in the marine environment from the outflow of the Po, Adige, Livenzo and Soča rivers,
   - improve the status of commercially important species of fish and other organisms in the Mediterranean Sea region and Adriatic sub-region.

5.4.2 Water regulation

Current situation and challenges

Preservation and adjustment of water quantities

Although Slovenia is relatively rich in water resources, the data show that due to the occasional lack of precipitation and its unfavourable temporal distribution, drought is a problem and poses an increasing risk in Slovenia as well. Drought is a common natural phenomenon in Slovenia, only its frequency and intensity are changing to the point that in the event of more intense droughts, the consequences are noticeable in all areas of the economy. In accordance with the Waters Act, the NEAP 2020–2030 deals with hydrological drought. The most commonly addressed aspect of drought is agricultural drought, for which

the damage has been recorded even at the national level. The damage caused by agricultural drought was highest in 1992, 1993, 2000, 2003 2006, 2012 and 2013. The total amount of damage in the period of 1991–2015 amounted to approximately 760 million euro. As a result of the lack of water, there are occasional problems with the drinking water supply in dry months, and reduced river flows have consequences for electricity production and tourism. Measures must be taken to mitigate the consequences of droughts, which can be achieved by water retention and the restoration of dead river branches, which also has a favourable effect on groundwater levels. With its water-retention ability, the forest is also an important buffer of drought extremes; it is an indispensable link in the drinking water supply. Therefore, the hydrological function of the forest must be properly planned in forest management plans.

In Slovenia, floods are a natural phenomenon that cannot be prevented. Some human activities (such as the growth in settled areas and property value in flood-plain areas and reduction of natural retention of water) as well as climate change contribute to the increased probability of the occurrence and harmful consequences of floods. Floods can cause the loss of human lives, migration and environmental damage, as well as seriously threaten economic development. In Slovenia, flood areas cover up to 10% of the territory, and 1190 flood risk areas have been identified. 61 areas comprise half of the country's total flood damage potential.

Various parts of Slovenia were often flooded in the last 25 years. In addition to fatalities resulting from floods, major flood events in Slovenia have caused around 2,100 million euro in damage in the last 25 years. In the last ten years alone, the amount of damage caused by major flood events in 2007, 2009, 2010, 2012 and 2014 was approximately 1,200 million euro. In the last ten years, Slovenia has therefore suffered approximately 120 million euro annually in direct damage as a result of floods; taking into account additional indirect damage (loss of revenue of economic entities, collapse of companies, disrupted infrastructure and communication links), the estimate is that floods in Slovenia annually cause approximately 150 million euro of damage.

Flood risk is, however, reduced by the forest cover of Slovenia and the sustainable concept of forest management, which is realised through measures of forest management plans. The operation of hydroelectric power plants must also contribute to the management of flood risk and, by maintaining and regulating water quantities, make a positive contribution to achieving environmental goals in the field of waters.

Maintenance of watercourses, water facilities and water and coastal lands

The regular maintenance of watercourses, water infrastructure and water and coastal lands is one of the obligatory (state) economic public services performed by select concessionaires in this area in accordance with the Slovenian legal order. The scope of work of the public service is planned and programmed with a programme of works containing an annual maintenance programme with tasks of regular and investment maintenance works. The purpose of the maintenance of water and coastal lands is to prevent the harmful effects of water on water and coastal lands, especially in sections where water facilities, settlements and economic infrastructure or the flow of high waters could be endangered. Due to a lack of financial resources, the prepared programmes are implemented to a limited extent.

Water regulation goals

The measures in water regulation will achieve the following:

- protection against the harmful impact of waters,
- preservation and adjustment of water quantities,
- effective maintenance of watercourses, water facilities and water and coastal lands.

Guidelines and measures in water regulation

Preservation and adjustment of water quantities

The preservation and adjustment of water quantities covers the implementation of measures to ensure the quantitative, temporal and spatial distribution of water needed to supply the population with drinking water, the existence of aquatic and riparian ecosystems and the exercise of water rights. The measures also include the enrichment of water bodies during low water conditions.

To support the planning of measures for the conservation and regulation of water quantities, the hydrological monitoring of surface water and groundwater will be carried out. For drought management, the measures set out in the Programme of Water Management Measures will be implemented. It mainly addresses the development of indicators for declaring different levels of drought or water shortage by identifying areas where the exposure to the harmful effects of drought is possible. Measures will also include the promotion of adapted agricultural production, such as the production of low-water crops in arid areas, and measures for efficiency and reuse – including the promotion of water-efficient technologies in industry and water-efficient irrigation methods. Priority will be given to implementing measures with synergistic effects, such as the construction of reservoirs that retain water when water is high and allow the use of excess water in drought conditions.

There is a plan to prepare a set of measures to mitigate the effects of droughts, which will take into account the following priorities:
- increasing drought resilience and thus reducing drought damage,
- water efficiency in agriculture and the urban environment,
- better planning, which includes demand-side management, land use planning, the development of a drought observatory and indicators, greater integration of water shortage and drought into river basin management plans and sectoral policies and spatial planning,
- use of implementing instruments such as funding water efficiency, pricing and allocation of water,
- implementation of measures with synergistic effects.

Flood risk management is an important part of water management, which, taking into account the fact that floods cannot be completely prevented or people cannot be completely safe from them, includes activities that reduce the likelihood of floods and the possible consequences of floods. Flood risk must be minimised and, in order to avoid new risks, the introduction of new damage potential into flood areas must be prevented to a maximum extent. Rivers therefore need to be given more space, taking into account the conservation or restoration of floodplains. Measures to prevent and reduce damage to human health, the environment, cultural heritage and economic activities should also be implemented, with construction and non-construction flood risk reduction measures aimed at:
- avoiding new flood risks,
- reducing flood risk,
- reducing flood risk during and after floods,
- raising awareness of flood risk.

Flood risk management measures will be implemented until 2021 in accordance with the Flood Risk Reduction Plan for the 2017–2021 period, which is the basic document for flood risk management and covers the following 20 types of flood protection measures that are the basis for project planning in individual river basins:
M1: determine and consider flood areas,
M2: identify, establish and conserve levelling surfaces of high waters,
M3: adjust land use in river basins,

M4: implement hydrological and meteorological monitoring,
M5: establish and keep flood risk records,
M6: educate and raise awareness of flood risk,
M7: plan and construct construction flood protection measures,
M8: implement individual (self-protection) flood protection measures,
M9: regularly check the effectiveness of (construction) flood protection arrangements,
M10: regularly maintain watercourses, water facilities and water and inshore lands,
M11: implement river inspections,
M12: carry out the flood protection management of water facilities,
M13: provide financial resources for the provision of water regulation services of general economic interest,
M14: draw up flood protection and rescue plans,
M15: carry out flood forecasting,
M16: carry out flood alerting,
M17: carry out flood interventions,
M18: carry out damage estimation and post-flood rehabilitation,
M19: document and analyse flood events,
M20: carry out systemic, normative, financial and other measures.

In the future, flood risk management measures will be set out in flood risk reduction plans for six-year cycles, which will also include reviewed and, if necessary, updated flood risk assessments and flood risk maps and flood risk management maps.

Maintenance of watercourses, water facilities and water and coastal lands

Providers of the obligatory services of general economic interest draft annual work programmes that cover the monitoring of the condition, operation and maintenance of water infrastructure intended for the conservation and adjustment of water quantities and protection against harmful effects of water, the implementation of emergency measures during times of increased risk of damage caused by waters, and the maintenance of water and coastal lands of inland waters and the sea. Water infrastructure facilities control the directions and quantities of the surface water outflow and flow of water and debris in watercourses. In this way, traffic, energy, communication and community infrastructure and other constructed facilities along watercourses are protected from damage. In recent years, insufficient financial resources were available for the implementation of the services of general economic interest of regular maintenance of watercourses, water infrastructure and water and coastal lands in Slovenia. In the coming years, it will be necessary to ensure a sufficient (at least 25 million euro/year), permanent and integral-budget-financed public service of regular maintenance of watercourses, water infrastructure and water and coastal lands, and to ensure the quality, sustainability (with the maximum use of natural materials such as native stone and wood) as well as the effectiveness of its implementation.

The implementation of water management measures will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

6 A LOW-CARBON AND RESOURCE-EFFICIENT SOCIETY THAT PREVENTS THE GENERATION OF WASTE AND TREATS THE GENERATED WASTE EFFICIENTLY

Current situation and challenges

Current situation and challenges regarding GHG emission reduction

A low-carbon society is a society with low GHG emissions. In Slovenia, efforts towards reducing GHG emissions are in accordance with the Operational Programme for Reducing GHG Emissions until 2020 (hereinafter: the OP GHG 2020). The final goal regarding GHG emissions is a so-called carbon neutral society, therefore a society with zero net GHG emissions.

The OP GHG 2020 measures take into account the legally binding goals for non-ETS sectors in Slovenia:

- in 2020, GHG emissions for sectors not included in GHG emissions trading (non-ETS) will not increase by more than 4% compared to 2005,
- annual GHG emissions from non-ETS sectors in the 2013–2020 period will not exceed the value of the linear trajectory up to the target value in 2020.

In the OP GHG 2020, measures are aimed at achieving greater development effects of invested public funds and improving the cost-effectiveness of the implementation of measures; therefore, this programme focuses on measures in areas or sectors with the largest shares of GHG emissions: energy-saving building renovation, transport, agriculture and waste management. At the same time, the OP GHG 2020 determines the indicative sectoral goals by 2020.

The reports on the monitoring of the implementation of the OP GHG 2020 show that the Republic of Slovenia achieves and currently significantly exceeds the annual targets in GHG emissions in the non-ETS sectors. After two years of increasing GHG emissions from non-ETS sectors, emissions decreased again in 2017 (a 2.8% decrease compared to the previous year) and were 10.8% lower than the annual target set by the EU regulation. Although projections show that Slovenia will achieve the goals set for 2020 by the EU regulation, the achievement of the indicative sectoral goals from the OP GHG 2020 remains uncertain.

Although the assessment of the achievement of the goals paints a rather encouraging picture of the evolution of emissions, it should be noted that the OP GHG 2020 also covers most of the measures to achieve the national targets in 2020 in energy efficiency and renewable energy sources. The effectiveness of measures for GHG reduction is therefore assessed also from the aspect of achieving the above goals. The field of energy efficiency in Slovenia in 2017 was still within the framework of the indicative annual goal, but the achievement of the goal in 2020 is questionable. The situation regarding the achievement of the renewable energy source goal in 2020 is, however, rather critical. In 2017, according to SURS data, the share of RES in gross final energy consumption in Slovenia was 21.5%, while the target share is 25%.

In recent years, it has also been shown that the pattern of changes in the emissions of non-ETS sectors depends mainly on changes in emissions in the transport sector, which generates about 50% of these emissions.

GHG emissions from buildings have recently been characterised by a different pattern of change. After a considerable reduction in the 2005–2014 period, emissions increased in 2015–2016 and decreased again in 2017 by as much as 8.2%. To achieve the

indicative sectoral target in 2020, emissions will have to be reduced by a further 7.7 percentage points in 2018–2020.

After an almost 7% increase in 2016, GHG emissions from transport decreased by 3.4% in 2017 compared to the previous year, and, in general, the change in emissions from this sector is a reflection of multifaceted factors, which are also significantly influenced by gross domestic product growth and transit traffic. The variability of these emissions on an annual basis can be as high as 18%, which means that even short-term significant growth in the use of motor fuels can seriously jeopardise the achievement of targets. In support of reducing GHG emissions in transport, important steps have been taken in recent years to achieve sustainable mobility, as integrated transport strategies were adopted in urban municipalities in 2017, active participation of municipalities in the platform for sustainable mobility was achieved and significant financial support was provided in the implementation of sustainable mobility measures of municipalities. Measures to promote public passenger transport are among the most important measures of the OP GHG 2020 in terms of effect, but the desired progress has not yet been made in their implementation.

Further emission reductions will also have to be ensured by 2020 in the non-ETS industry sector, which accounts for 10% of the emissions structure.

In agriculture, the indicative target is expected to be achieved due to a stable trend and slow changes.

Regarding the reduction of GHG emissions, an important indicator is also emission productivity, which goes hand in hand with the environmental efficiency of the economy and also shows whether the growth of the economy is based on the increase of GHG emissions. The latest values of the indicator show that emission productivity improved again in 2017 after a decrease in 2016, but progress is still too slow compared to other EU Member States. In order to achieve the set indicative target, the importance of reducing GHG emissions will have to be further taken into account when programming measures to strengthen the economy.

Subsidies with adverse effects on the environment can be considered as one of the key reasons for the increase in GHG emissions during times of economic growth. The year 2017 saw another increase in subsidies that are in contravention with the achievement of the GHG emission reduction goal. They amounted to 135.2 million euro. On the other hand, funds for promoting measures to reduce GHG emissions in the public sector, households and transport have been declining in recent years. In 2016, only 24.6 million euro in grants were allocated, which is 52% less than in the previous year, and only 21 million euro were allocated in 2017.

Current situation and challenges in resource management

Although prosperity growth in developed countries was and is still based on the intense and frequently inefficient use of resources, the period of low-cost resources in unlimited quantities is over. However, resource and energy efficiency are improving too slowly in view of the long-term goals set, and further systematic measures will be needed to eliminate the gap in comparison to more developed countries and achieve long-term goals concerning the reduction of GHG emissions.

As resources are very diverse, their protection and management falls within the competence of several policies (environmental, spatial, mining, agricultural and forestry, energy, transport, economic, financial), and which have been addressed in strategic and programming documents of these policies. As regards resource management, the NEAP

2020–2030 details the protection of natural resources (biodiversity, soil, air, water), water consumption and waste management.

Despite the importance of resource efficiency, which is among the key development guidelines, Slovenia does not yet have in place a mechanism comprehensively promoting the efforts for the efficient management of all resources and which would harmonise and combine the efforts of the entire society for their protection and efficient use. Slovenia will strive for the equal use of all appropriate renewable energy sources with the primary emphasis on exploiting the potentials of solar, wind and hydro energy, biomass and the so far completely overlooked geothermal energy. The measures will be improved so as to facilitate and accelerate the siting of facilities for the production of renewable energy sources.

The economic system mostly still allows and even promotes resource inefficiency by pricing certain energy products and resources below the actual costs, which is also due to the overly slow progress in the inclusion of costs of natural resources and their services (the so-called external costs) in the price of products and services.

In the 2007–2012 period, Slovenia recorded an above-EU-average increase in material productivity, which is one of the basic indicators of a circular economy and measured as the ratio of GDP to raw and other materials consumed. This was associated with lower building activity and consequently reduced use of non-metallic minerals. Fluctuations in the scale of this activity had a significant impact on the consumption of materials in the following years.

Material productivity increased to 85% of the EU average in 2015, which means that GDP generated per the same quantity of consumed material in Slovenia was lower by 15% compared to the EU average. As regards material consumption, one should point out the high share of consumption of sand, gravel, limestone and plaster, which amounts to about 50% and exceeds the EU average. Further increase in material productivity of Slovenia’s economy will be more difficult to achieve when the building activity is revived.

Although Slovenia’s territory has little natural resources directly used in industry, which makes it highly dependent on the import of materials, the activities of Slovenian companies in terms of improved resource efficiency are lower by a half in comparison with the EU average.

In annual reports on Slovenia’s development, the analysis of the environmental dimension of economic development is based on a comparison of the economic growth with the use of materials, energy, water and GHG emissions (Figure 6). After the anticipated reduction of resource usage at the time of crisis, their use is growing again, but the growth level of resource use and GHG emissions is smaller than the GDP growth level. Such a ratio will be difficult to achieve at the time of an economic boom without additional measures for greater energy and resource efficiency.

Faster improvement in resource productivity is mainly limited by higher energy consumption in transport, which, with a significant unsustainable orientation, has a large impact on the environment (and still generates considerably more emissions per unit of gross domestic product than the EU average). In terms of the share of renewable energy source use, Slovenia is more successful than the EU average; the share, however, has not increased in recent years.

Slovenia’s challenge is to base its development on a use of resources that does not exceed the environmental carrying capacity of the planet, which will be monitored by the environmental footprint, a synthetic indicator of development. This increased relatively rapidly in the period of economic growth and declined to around the pre-existing level during the

recession. According to the latest calculation for 2014, it amounted to 4.7 gha/person, which was approximately the average level of European countries. GHG emissions are the main cause of Slovenia's relatively high ecological footprint, which exceeds its biological capacity to an extent greater than the European average.

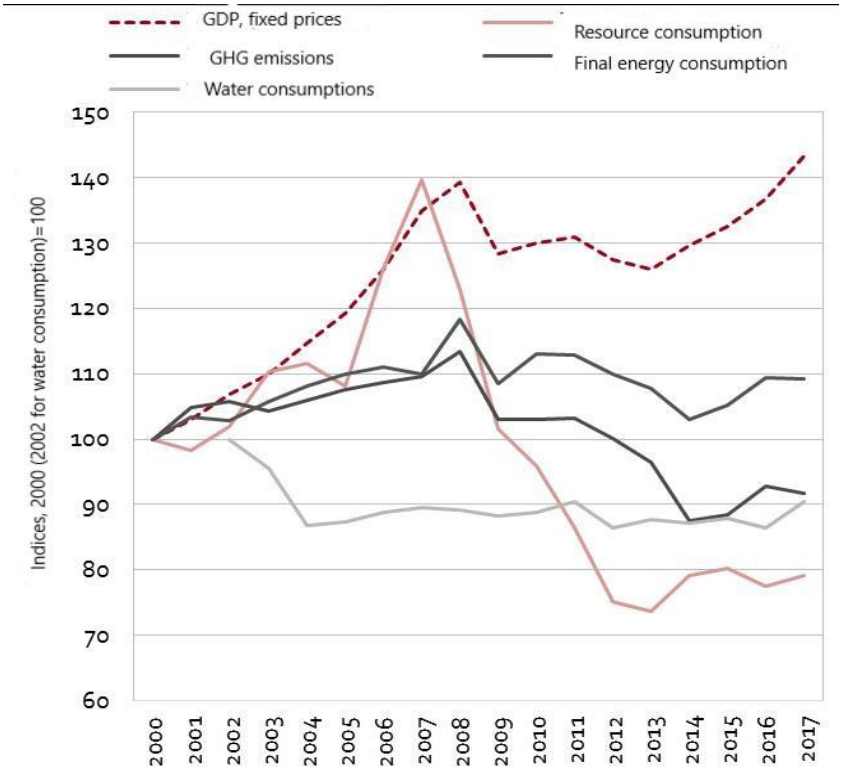

Figure 6: GDP growth in relation to growth in the use of energy, resources and water, and GHG emissions
Source: UMAR, Development Report 2019

The challenge of more efficient resource management is comprehensive and requires a response that includes the comprehensive and coherent management of sectoral policies at the level of the state, regions and local communities as well as the economy and households, recognising that the shift to resource efficiency and the reduction of greenhouse gas emissions requires thorough interventions in the method of production and consumption and, above all, lifestyle change. Policies such as energy, industrial, agricultural, fisheries and transport policy will need to be transformed; some economic mechanisms will need to be readjusted and awareness will need to be raised in order to accept, implement and accelerate the necessary changes. Sustainable shifts may be based on the tradition of good practices for managing natural resources such as forestry and water policy, and on knowledge and good practices of companies. Another guiding principle may be the benefits of creating green jobs.

Current situation and challenges concerning the prevention of waste and effective waste management

Improper waste management causes a loss of useful materials (secondary raw materials), which, in addition to the loss of their value, also pollute the environment and can have a detrimental effect on the climate.

Waste is a substance or object that its owner discards, intends to discard or must discard. Waste may be hazardous or non-hazardous. Hazardous waste is one that is classified as hazardous waste due to one or more hazardous properties.

From the aspect of environmental protection, priority is given to efforts of not generating waste in the first place, while the generated waste should be surrendered to collectors, processors or disposers in a prescribed manner. Waste reuse and recycling is important from the aspect of resource efficiency.

Slovenia has recently made good progress in waste management.

In the separate collection of municipal waste as the most diverse group of waste, the share of separately collected municipal waste increased from 9% in 2002 to 70% in 2017. Also, the share of recycled municipal waste in 2017 reached 57.8%, and waste disposal, which is the least desirable waste management procedure in the waste hierarchy, has decreased by 86% since 2006: by 83% at “municipal” landfills and by 94% at industrial landfills.

The number of landfills where waste was disposed of in a given year also decreased significantly – by 72% in the 2006–2017 period (from 60 to 17): the number of “municipal” landfills by 74% (from 43 to 12) and the number of industrial landfills by almost 65% (from 17 to 6). Although significant progress has been made, ongoing measures are needed to limit waste disposal exclusively to the waste that cannot be recycled or processed into solid fuel or heat-treated.

Despite the progress in waste management made in recent years, further steps are needed regarding effective waste management, as many types of waste are used only for a short time or are lost to the economy because they are placed in a landfill or because recycling reduces their quality or the market of secondary raw materials is not sufficiently developed. Therefore, more emphasis should be placed on the reuse and recycling of waste as a priority treatment of waste, which needs a combination of measures aimed at creating a recycling economy. These measures include product design, better cooperation of market participants, better waste collection procedures, an appropriate legislative framework, incentives to prevent and recycle waste, and investments in modern waste facilities and high-quality recycling.

In addition to the above challenges, Slovenia is facing systemic challenges concerning the self-sufficiency of waste management, especially the energy recovery of waste, revitalisation of landfill areas, hazardous waste management, public service system and the extended producer responsibility (hereinafter: EPR) instrument.

The prevalent type of exported waste is that intended for thermal use, because there are currently insufficient capacities for this type of processing in Slovenia. Slovenia has enough potential capacities for the estimated required energy recovery of 90 MW of input thermal power of fuel produced from combustible fractions of municipal waste in the operating waste incinerator and in operating large combustion plants and industrial furnaces, but these potentials cannot be fully exploited in the short term due to reasons such as the adoption of new spatial plans, obtaining environmental permits, implementing new technical solutions and different levels of social acceptability. At the moment, 20 MW is provided by the Celje District Heating Plant.

As the cross-border energy recovery of fuel from municipal waste does not ensure Slovenia's long-term self-sufficiency in this area, especially in the energy recovery of fuel from mixed municipal waste, more attention should be paid to this method of energy recovery and the thermal use of municipal waste should be ensured in accordance with the

Environmental Protection Act provisions; in accordance with the waste management hierarchy, such use takes precedence over waste incineration without energy recovery and waste disposal.

The inspection of registered landfills in Slovenia found excessive pressures on the environment in some places, which, despite the implementation of measures to prevent and reduce environmental pollution, are not significantly reduced. This revealed a need for the systemic regulation of this area by developing standards for the revitalisation of landfill areas by defining the conditions for obtaining an environmental permit for the rehabilitation of the environment in the landfill area that would provide usable space or additional landfill space.

Another challenge in waste management is hazardous waste management. Since Slovenia's processing capacities are insufficient and there are needs for special processing technologies, a considerable share of hazardous waste is exported. In general, bigger countries have more diverse and technologically sophisticated facilities for waste recovery and disposal. A complete dependency on foreign countries, may, however, constitute a strong limiting factor, high costs and consequences for the economy where this waste is generated.

Until the accident that took place in one of the larger hazardous waste collection and processing plants in 2017, there were no problems with the collection and further handling of this type of waste; the accident, however, revealed the need for an additional contingency plan for emergencies affecting waste management at the systemic level.

The competence for the normative arrangement of waste management and implementation of tasks related to waste lies both with the state and with local communities. Municipalities independently carry out the matters of public relevance which are defined by the general municipal act or by law as inherent tasks. In order to meet the needs of the population, they collect and treat municipal waste and, within their competences, regulate, manage and oversee municipal public services in accordance with the law governing local self-government.

In accordance with the Environmental Protection Act, the public utility services provided include the mandatory municipal public utility service of the collection of certain types of municipal waste, the treatment of certain types of municipal waste and the landfill of waste recovery residues or the disposal of municipal waste, and the mandatory national public utility service of municipal waste incineration.

The EPR principle is a form of compliance with the polluter pays principle, which is one of the modes of design and production of products that fully complies with and simplifies resource efficiency throughout a product's life-cycle, including repair, reuse, decomposition and recycling of these products without threatening free movement of goods in the internal market. A legal or natural person developing, manufacturing, processing, selling or importing products subject to EPR (the product producer) must partially or fully ensure such treatment of products and waste generated by their use that promotes the reuse and prevention and processing of waste. In accordance with the EPR principle, regulations govern the management of packaging waste, end-of-life vehicles, waste tyres, waste electrical and electronic equipment, waste batteries and accumulators, waste plant protection products containing hazardous substances, waste medicinal products and graveside candle waste. The implementation of extended producer responsibility in practice should be improved by including the EPR principle in regulations and by establishing an institutional framework with unambiguously delimited competencies and responsibilities as well as effective supervision. The key precondition for the efficient implementation of the EPR principle is to provide an insight into the fulfilment of obligations of liable persons and the appropriate management of the waste mass flows.

An important challenge for Slovenia is the implementation of the Operational Programme for Waste Management, which already sets out systemic goals and measures until 2020 and 2030, respectively, that will have to be adapted and harmonised with the new EU waste legislation of 2018, which is onerous in terms of expertise and costs. It is aimed at more demanding implementation of waste management hierarchy and higher recycling targets. A particular emphasis is placed is on the transition to a circular economy with the purpose of assisting European companies and consumers in the transition to a circular and thus more competitive economy, in which the resources are used in a more sustainable way. The measures are believed to "close the loop" of product life cycles and benefit both the environment and the economy.

Among individual waste flows, plastics management in accordance with the European Strategy for Plastics in the Circular Economy will be an important challenge for Slovenia in the future. The generation of plastic waste and its disposal constitute a burden on the environment as well as the unused capacity of plastic waste for its recycling, reuse and energy recovery. A particular challenge from the point of view of environmental pollution is microplastics, which accumulate in the sea and can pass into the food chain through marine organisms. The reduced production and use and more economical management of plastic waste will also have a beneficial effect on achieving global climate change mitigation targets and reduce energy dependence on fossil fuels. To this end, it will be necessary to limit the use of plastic bags or even abolish them, monitor and reduce the amount of marine waste, reduce the consumption of single-use plastics and limit the deliberate use of microplastics.

About 25.8 million tonnes of plastic waste is annually generated in Europe. Less than 30% of it is collected for recycling. In the EU, about half of the plastic waste collected is sent abroad, where different environmental standards lead to uncertainty about its treatment. More than 85% of exported plastic waste is sent to China, which banned the import of certain plastic waste in January 2018, which means that not only Slovenia but also the whole continent is facing excessive flows of plastic waste and insufficient infrastructure for plastic recycling. The European Strategy for Plastics thus provides that this infrastructure in the EU should increase by four times by 2030. One of the key reasons that the pollution of waters with plastic waste poses such a great threat to the sea is the extremely long lifetime of plastic materials. Due to its persistence and accumulation, such waste travels long distances carried by sea currents and winds, thus polluting not only the area of its input, but also the remote areas that are not directly burdened with the sources of waste input. The problem has been identified at the highest international levels, where several initiatives have been made at the UN under the auspices of the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (the Basel Convention) and the Convention on the Protection of the Mediterranean Sea against Pollution, for establishing global partnerships in plastic waste treatment.

Another challenge for Slovenia is the prevention and reduction of food waste, especially with regard to achieving the indicative target of reducing food waste in the EU by 30% by 2025 and by 50% by 2030. In 2017, almost 131,800 tonnes of food waste was generated in Slovenia. Each resident of Slovenia threw away 64 kilogrammes of food on average. The waste amounted to an estimated 38% of edible food parts that could have been reduced or prevented through awareness-raising and a better attitude towards food. Measures to address this challenge should be aimed at preventing and reducing food waste in primary production, processing and production, retail and food distribution, and in restaurants and catering, as well as in households.

Goals

Goals for reducing GHG emissions

Slovenia is party to the Paris Agreement, whose goal is to hold the increase in the global average temperature to below 2°C above pre-industrial levels. The desired goal of the Paris Agreement, however, calls for further efforts to limit the increase in the global average temperature to below 1.5°C, which, according to relevant institutions (such as the IPCC and UNEP) and world scientists, is the limit to which man-made climate change is still manageable. To achieve this goal, developed countries should, by transitioning to sustainable development, reach net zero GHG emissions by the middle of the century.

To prevent the adverse affects of climate change and in accordance with the international vision of holding the increase in the global temperature to below 2°C:

- Slovenia will maintain full separation between economic growth and GHG emissions,
- Slovenia will assume its part of the responsibilities for climate change mitigation in accordance with the Paris Agreement goals,
- Slovenia will contribute at least such a reduction in greenhouse gas emissions as needed to achieve the common goal to which the European Union and Member States will be committed,
- Slovenia will advocate ambitious and clear EU policy on climate change mitigation targeting the achievement of the net zero level of GHG emissions by 2050,
- Slovenia will insist that the intermediate objectives of emission reduction by the UNFCCC parties by 2050 take into account scientific recommendations on the necessity of action,
- Slovenia will also contribute to the effective addressing of the climate change by fulfilling other obligations from the Paris Agreement, including commitments with regard to the transfer of knowledge and technologies, capacity building and climate-related financing,
- sectoral goals of GHG emission reduction will be determined by a national energy and climate plan,
- a long-term national policy will be determined by the climate strategy of Slovenia by 2050.

Goals concerning resource efficiency

Resource efficiency measures in Slovenia will:

- increase the compliance of resource usage with biocapacity by 2030 with a 20% smaller ecological footprint in comparison to 2013,
- preserve the separation of economic growth from resource usage,
- keep material productivity above the EU average,
- facilitate the siting of renewable resource generation facilities.

Goals in waste management

Measures for handling plastics will:

- achieve the consumption goal of fewer than 40 plastic carrier bags per person by 2025,
- achieve the goal of producing bottles using 25% recycled PET by 2025 and 30% by 2030,
- achieve the goal of 77% of PET bottles being collected separately by 2025 and 90% by 2029,
- achieve the goal that plastic containers up to three litres in size will have fixed caps by 2024,
- by 2021, achieve the goal of banning plastic cutlery (forks, knives, spoons and chopsticks), plastic plates, straws, food containers made of expanded polystyrene, such as fast food boxes, with or without lids, used for food, intended for immediate consumption on the spot or for being taken away by consumers, and ready for use without further preparation, beverage containers and beverage cups made of expanded polystyrene, plastic products degradable by oxo-oxidation, and plastic cotton buds;

- by 2026, reduce the consumption of plastic pots, including lids, and plastic food containers, with or without lids, used for food intended for immediate consumption or taken away by consumers and ready for use without further preparation such as cooking;

and following other long-term goals in waste management will be achieved:

- the preparation for reuse and recycling of at least 55% of the mass of municipal waste by 2025, and then of at least 60% by 2030,
- at least 65 of mass % of all packaging waste will be recycled by the end of 2025, with the following target mass shares for individual waste packaging materials: 50% of plastic, 25% of wood, 70% of iron and steel, 50% of aluminium, 70% of glass, 75% of paper and cardboard,
- at least 70 of mass % of all packaging waste will be recycled by the end of 2030, with the following minimum mass shares for individual waste packaging materials: 55% of plastic, 30% of wood, 80% of iron and steel, 60% of aluminium, 75% of glass, 85% of paper and cardboard,
- from 2021 onwards, at least 65% of the average mass of electrical and electronic equipment (EEE) placed on the market in Slovenia in the last three years, or 85% of the average mass of waste electrical and electronic equipment (WEEE) generated in Slovenia, will be collected annually,
- the level of collected waste portable batteries and accumulators will exceed 45%,
- the quantity of waste food will be reduced by 30% by 2025 and by 50% by 2030.

Guidelines and measures for achieving goals

Slovenia has already adopted important strategic decisions steering ministries and stakeholders towards a low-carbon society and resource management, which has been done as follows:

- in horizontal documents concerning several policies, such as: Slovenia's Development Strategy 2030, Framework Programme for the Transition to a Green Economy, Smart Specialisation Strategy and Operational Programme of Financial Perspective 2014–2020,
- in documents of individual policies, such as: Slovenian Industrial policy (SIP), OP GHG 2020, documents in transport and energy policy,
- in strategies, programmes and plans concerning individual resources such as: Renewable Energy Sources Action Plan 2010–2020, Strategy for Development of the Market in Order to Develop Appropriate Alternative Fuels Infrastructure in the Transport Sector in the Republic of Slovenia, Operational Plan for Waste Management, National Mining Strategy, National Forest Programme, and Spatial Planning Strategy.

The development goal of Slovenia is to sever the link between economic growth and the increase of GHG emissions and resource usage by 2030. The principal goal to be achieved is for Slovenia's development to not be based on the use of resources exceeding the environmental carrying capacity of the planet, which will be monitored by the environmental footprint, a synthetic indicator of development. However, given the large share of the carbon footprint in the environmental footprint, this indicator will mainly measure the success of measures for the transition to a low-carbon and resource-efficient circular economy.

A low-carbon society and responsible resource management are important highlights of sustainable development that will require fundamental changes in production and consumption patterns and especially the following steps:

- improve the utilisation of resources (especially those which are already integrated into systems – e.g. mobility, the built environment, food supply chains, production chains) and make waste management more effective (preventing waste, using waste as a

source of secondary raw materials and establishing an effective waste management system),
- prioritise energy efficiency (EE) and renewable energy sources (RES) as the basic principles of energy development, which implies especially the replacement of fossil fuels by promoting EE and RES use at all energy use levels, as well as the development of technologies for storing energy and digitalisation of the electricity system (the introduction of a “smart network”) as one of the key factors for increasing the share of RES. It should be noted that the efficient consumption of raw materials and the efficient consumption of energy are co-dependent, since strategies for increasing material efficiency can be just as effective at lowering energy consumption as measures for increasing energy efficiency,
- ensure that the infrastructure and energy use in transport support the transition to a low-carbon circular economy and enable sustainable mobility, including through the introduction of new concepts of mobility, the development of public passenger transport and optimisation of transit transport, and territorial decentralisation of public administration where appropriate,
- promote, especially in the economy, innovation and information and communication technologies to develop new business models and products which use raw materials and energy more efficiently and to introduce circular economy principles.

The changes in consumption and production patterns will need to be supported by:
- education and integration and promotion of environmental innovations, i.e. innovations for developing new business models and products which use raw materials and energy efficiently,
- using spatial planning to design hubs for the low-carbon circular economy and progressive development solutions at the regional and local levels,
- the elimination of legislative and social obstacles,
- measures ensuring the socially just distribution of burdens.

The above guidelines are part of the Framework Programme for the Transition to a Green Economy adopted in 2015, which implies a political decision that the transition to a green economy is an environmental and economic necessity. The key areas of the transition to a green economy identified within the goal of “conservation and efficient management of natural resources, providing a high-quality living and working environment” are the following:
- sustainable management of resources,
- green economic growth,
- promotion of green jobs and training persons in the labour market for the needs of the green economy,
- promotion of demand for green products and services, green public procurement,
- green budget reform,
- sustainable urban development with the sustainable construction of public buildings and sustainable mobility,
- public service activities that can serve as a model,
- education and training for the green economy,
- green practices in agriculture and forestry,
- supporting activities.

Specific measures for achieving the goals in GHG emission reduction and low carbon footprint will be set out in the comprehensive National Energy and Climate Plan (NECP).

Measures for waste prevention and management are already set out in the Operational Plan for Waste Management (until 2020 and 2030, respectively). The programme follows the strategic orientations of EU policies, which, while emphasising waste prevention, give priority to the preparation of waste for reuse and recycling before its energy

recovery, and to the recovery of waste before its disposal. The measures for achieving goals take into account EU regulations and national legislation and are mostly legislative, organisational and financial. With regard to waste prevention, measures focus on the companies that generate the largest quantities of waste, households and the public sector, as well as the following waste flows: construction waste, lightweight carrier plastic bags, bulky waste, food waste, waste textile and clothes. The principal goal of the waste prevention programme is to reduce the amount of waste generated and to minimise its harmful impact on the environment. In the field of waste management, Slovenia will implement measures to prevent waste generation as a matter of priority, the priority order of waste management being as follows: preparation for reuse, recycling, recovery, disposal.

in addition to the measures in place, the achievement of the goals of waste prevention and management will require the establishment of an effective waste management system, whereby the redrafting of the legislation and ensuring its effective implementation must take a priority position. Legally binding goals are of key importance for the improvement of waste management, the promotion of innovation and recycling, limitation of landfilling and creation of incentives that could change the behaviour of consumers. The enhancement of the waste policy also contributes towards a healthier environment, lower GHG emissions and sustainable growth and the creation of jobs.

Despite the good design, inter-ministerial consensus and support, and the completed public discussion, the aforementioned strategies, programmes and plans are not enough for a systemic shift. Resource efficiency and the transition to a low-carbon society will not be possible without a robust system for monitoring progress and knowledge dissemination, as well as the right incentives and instruments enabling everybody to carry out their job properly.

Taking into account the strategic decisions already taken and the measures presented in Table 5, the NEAP 2020–2030 proposes a comprehensive and long-term framework with some key new systemic measures to ensure that the transition process to more efficient resource management and a low-carbon society is comprehensive, systematic and effective.

Table 5: Measures for GHG emission reduction, resource efficiency and waste prevention and effective waste management

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Greening of key line ministry policies	Efforts of line ministries for the consistency of strategic and operational documents of their policies (agricultural, forestry, food, energy, transport, spatial, construction, economic, financial, regional and local development) with the concept of efficient use of sources and low carbon footprint. Introduce the green test for government documents.	ecological footprint	ministries MF, MOP / GSV	ongoing task
	Develop guidelines for the assessment of plans and programmes and legislation in terms of achieving resource efficiency and a low carbon footprint, including energy efficiency and renewable energy sources, for use in integrated environmental impact assessment procedures, including cross-border comprehensive environmental impact assessments.	developed guidelines	SVRK / MOP, MGRT	2021
	Draft the National Energy and Climate Plan.	drafted plan	MZI / line ministries	2020
	Devise the long-term climate policy of Slovenia, draft five-year carbon budgets, draft five-year climate plans and five-year plans for adapting to climate change.	drafted strategy, budgets, plans and programmes	MOP / line ministries	2020 and onwards
Regional and local development	Harmonise the steering of regional and local development enabling a synergistic contribution of development measures to environmental protection goals.	completed activities	MGRT, MJU, MOP / other ministries	ongoing task
Legislation	Slovenia's Climate Policy Act	adopted act	MOP / all line ministries	2020
Measures of programmes in force	Implement the OP GHG 2020. Implement the Operational Plan for Waste Management.	as indicated in the programmes		
Critical sources and materials	Define critical sources of raw and other materials important for the development of Slovenia, and draft the strategy of their provision in a sustainable manner.	drafted strategy	SVRK / MGRT, MZI, MOP	2022
	Survey the waste in Slovenia that may be used as a resource.	completed survey	MOP	2021
Monitoring of implementation of measures and their effects	Assess Slovenia's development using a broad range of indicators related to sustainable development (including ecological footprint).	application of indicators	UMAR	ongoing task
	Monitor the development of indicators and the green economy and indicators of efficient resource management in the EU and beyond. Apply them in Slovenia, where appropriate.		SURS, ARSO	

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Planning and steering of activities	Establish a resource efficiency centre: for professional support to planners and implementers, management and monitoring of measures in the country, monitoring of good practices of other countries, monitoring of research and innovation results and their application in practice.	functioning centre	SVRK / MOP, MGRT	2020
Support environment and promotion of research, development and innovation	Utilise in a systematic, harmonised and synergistic way the capacities of research and development partnerships, the research and innovation of competence centres and other development and sectoral instruments by utilising the previously used and new financial mechanisms (such as the EU Innovation Fund). Promote technological and non-technological innovations and their integration, such as the integration of sustainable mobility measures by including innovative services and technologies.	indicators of programmes and instruments	MGRT, MIZŠ / other ministries	ongoing task
	Integrate content regarding resource efficiency and the transition to a low-carbon economy into national research, development and innovation programmes and programmes for the use of EU funds. Monitor the contribution of these programmes to the NEAP 2020–2030 goals in terms of low carbon footprint and resource efficiency.	share of programmes with integrated content	MOP / all line ministries	
	Establishment of a scientific and climate change council.	functioning council	MOP	
Resource efficiency and emission productivity in companies	Provide support for investments in low-carbon and circular processes, technologies, products and services that are repaid in savings (energy, materials, etc.) and bring profit in a certain period of time and ensure competitiveness on a European or global scale while also benefiting human health and the natural environment. Monitor the development and smart introduction of these instruments into Slovenian legislation and/or practice: the environmental design of products and services, environmental technologies, environmental and carbon footprint of products and organisations, environmental accounting.	ecological footprint, indicators of material, energy and emission efficiency and resource usage	MGRT and MOP	ongoing task
Environmental instruments	Develop a plan for the support and development of the EMAS scheme or environmental management schemes for organisations (based on the analysis of the efficiency of the EMAS system in Slovenia). Promote measures for compliance of line ministry operation with the EMAS system principles.	drafted plan	MOP	2020 ongoing task
	Monitor the development of documents on best available techniques and the integration of resource efficiency measures in requirements in the issue of environmental permits (EP).	amended EP requirements	MOP-ARSO	ongoing task
Economic and financial	Ministries examine the possibilities of greening the initiatives within their competence.		ministries	ongoing task
	Include external, environmental costs in prices of products and services where possible and effective.		ministries	ongoing task

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
instruments	Analyse the adequacy of financial instruments for strengthening the market in secondary raw materials and water reuse and, if appropriate, amend them.	completed analysis and activities	MOP	2021
Implementation of key activities	Amend legislation (if appropriate) and/or draft guidelines for resource efficiency and the use of low-carbon technologies and techniques in key activities: the construction and use of buildings, food production, mobility, urban development, energy supply.	amended legislation and drafted guidelines	MOP, MKGP, MZI	ongoing task
	Strengthen the support (including financial, for example through the Climate Change Fund) for the measures of sustainable mobility and generation of energy from RES.	implemented measures, amount of funding	MZI / MOP	ongoing task
Waste management	Prevent waste food generation. Prevent and prohibit the use of certain plastic products.	environmental indicators	MOP / other line ministries when appropriate	ongoing task
	Establish standards for the revitalisation of landfill areas.	standards established		2023
	Elaborate the scenario for hazardous waste treatment in case of an emergency.	elaborated scenario		2020
	Systemically regulate the implementation of mandatory state and municipal public environmental protection services in waste management by amending the Environmental Protection Act and the act governing services of general economic interest.	amendment of legislation		2020
	Amend and increase the effectiveness of the implementation of the principle of extended producer responsibility (EPR) and obligations of individual stakeholders arising from it, including the obligations of persons responsible for common systems, and determine sources and purposes of financing systems (change of regulations, regulation of the register for monitoring the quantity and type of products placed on the market and monitoring of generated waste, improved inspections).	amended principle of EPR		2020
	Amend the regulation of income and costs of persons responsible for common systems, including the obligation of uniform and publicly available service price lists for all participants in a particular common system, report to competent authorities and supervise the plausibility of their disclosure.	amended regulations		2020
	Amend the conditions for the establishment of persons responsible for common systems, and regulate the scope of their operations and ownership relations with companies engaged in waste collection and treatment.	amended conditions		2020
	Update the environmental tax system to the full implementation of the “polluter pays” principle, and regulate the appropriate amount of the tax.	updated environmental tax system		

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
	Improve the record keeping, reporting, tracking and analysis of waste management data by upgrading records from the Environmental Protection Register and the Waste Information System. Supervise the reporting of liable persons and quality of reported data and regulate the records of producers in the extended producer responsibility system.	improved records, reports, analyses		ongoing task
Green public procurement	Periodically update (in accordance with the development of technology, the market and knowledge) the existing goals, requirements and criteria and examples.	drafted guidelines and implemented training courses	MOP, MJU / other ministries	ongoing task
	Provide training courses for clients and providers, provide constant assistance with a help-desk consisting of a network of experts.		MJU / MOP	ongoing task
Raise awareness and provide information to individuals in a simple and understandable manner	Draft guidelines for the public on how to take action in everyday life, including instructions on sustainable consumption and how to recognise greenwashing, and information on environmental labelling.	drafted guidelines	MOP/MKGP, MZI	ongoing task
	Declare a national climate day.		National Assembly	2020
	Raise public awareness of proper waste management and prevention. Provide information to consumers on the environmental impact of products (e.g. by using an ecolabel) by leaflets, web portals and other simple and visible campaigns addressing all social groups. Raise awareness with the aim of reducing the consumption of plastic bags.	implemented awareness-raising and information activities	MOP	ongoing task

The implementation of measures for GHG emission reduction, resource efficiency and waste prevention and effective waste management will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7 PROTECTION FROM ENVIRONMENTAL RISKS

7.1 Rehabilitation of areas excessively polluted in the past

Current situation and challenges

In the past, there have been several attempts to systematically regulate excessively polluted areas in Slovenia arising from mining and the operation of heavy industry, while in the 1980s, excessively contaminated areas were mostly the result of illegal and inappropriate waste disposal. Abandoned gravel pits and karst caves are a particular problem.

Individual rehabilitation procedures were carried out on the basis of special regulations or individual investment projects (e.g. the rehabilitation of the tar pit in Pesnica), and the rehabilitation of the excessively polluted area in the Upper Mežica Valley and land in the Celje Basin is underway.

So far, there has been no plan for the long-term rehabilitation of these areas, nor have permanent financial resources been provided for this purpose.

Goals concerning the rehabilitation of areas polluted in the past

The measures for the rehabilitation of areas excessively polluted in the past will ensure that:

- the rehabilitation of polluted lands in the Celje Basin will continue,
- the rehabilitation of the Mežica Valley will be completed by 2022,
- records of excessively polluted locations will be established in 2020,
- the rehabilitation of at least a third of excessively polluted locations recorded will be initiated,
- initiatives for the development of innovative methods for the rehabilitation of polluted areas will be provided.

Guidelines and measures for achieving the goals concerning rehabilitation of areas polluted in the past

In the future, the quality of the living environment will need to be improved in wider, geographically rounded areas as well as narrower areas of identified excessive pollution or degradation based on a long-term rehabilitation plan. However, these areas will have to be considered in the development and spatial planning procedures as areas of special development and a spatial category due to environmental protection measures (whose design is preventive as well as very prominently curative).

Table 6: rehabilitation measures for areas excessively polluted in the past

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Register of areas polluted in the past	Recording areas excessively polluted in the past.	established records	MOP / ARSO	2020
Rehabilitation planning	Draft the methodology for determining the order of rehabilitation of areas (except	drafted methodology	MOP	2020

	for the Celje Basin and Mežica Valley).			
	Draft the programme of rehabilitation of polluted areas.	drafted programme	MOP	2021
	Draft annual programmes of rehabilitation, elaboration and implementation of rehabilitation projects.	drafted annual programmes and completed rehabilitation	MOP, local communities, polluters	2020 and onwards
Determination of effectiveness of rehabilitation	Carry out environmental monitoring after the completed rehabilitation.	indicators of effectiveness of rehabilitation	MOP / ARSO	ongoing task
Development of innovative methods	Include content regarding the rehabilitation of areas polluted in the past in research programmes, the programme of use of cohesion funds and other important programmes.	number of studies completed, indicators of programme of use of cohesion funds	MOP	ongoing task

The implementation of measures for the rehabilitation of areas polluted in the past will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7.2 Environmental noise

Current situation and challenges

The environment in Slovenia is moderately burdened with noise; among those more significantly exposed are the inhabitants of larger towns and those living along busy roads and railways. Noise pollution is mainly due to traffic and to a lesser extent industrial activities. Development of less noisy means of transport, the limitation of driving speeds (e.g. at night), measures of active noise protection and slowing down of traffic in town centres have a positive impact on reducing noise pollution. Outdated means of transport, partly insufficiently maintained transport infrastructure and the fact that settlements have grown around roads contribute to the noise pollution of the living environment. The increase in production, service and tourism industry in turn increase the volume of personal and freight transport.

Goals of protection against environmental noise

The measures for protection against environmental noise will achieve the following goals:

- a reduction in the number of people being exposed to noise levels exceeding the noise indicator L_{day} = 55 dB(A),
- a reduction in the number of people exposed to noise levels at night exceeding the noise indicator L_{night} = 40 dB(A).

Guidelines and measures for achieving the goals of protection against environmental noise

Measures will focus primarily on reducing noise at the source through measures to achieve the goals of the Single European Transport Area plan, sustainable mobility measures and appropriate spatial planning and construction, in particular:

- modernisation of the rolling stock in road and railway transport,
- further electrification of railroads and introduction of electric vehicles,
- active anti-noise barriers for newly built or reconstructed roads or railroads,
- introduction of a system of non-refundable financial incentives for implementing measures of passive noise protection of buildings with protected rooms,
- improved urban development concept and development towards smart cities and urban mobility,
- careful spatial planning in all steps of preparation of municipal spatial acts and related changes of intended use and more detailed intended use in connection with the expansion of settlements near noise sources, taking into account environmental noise pollution resulting from strategic noise charts or noise monitoring, and to provide for appropriate noise protection measures,
- planning and implementation of noise protection measures in construction taking into account the environmental noise pollution,
- analysis of regulations, especially in spatial planning, construction and fiscal policy, from the aspect of their adequacy for achieving the goals of protection against environmental noise and their updating, if appropriate.

Table 7: measures of protection against environmental noise

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Analysis / update of regulations	Analyse regulations from the aspect of their adequacy for achieving goals of protection against environmental noise and update them if appropriate.	implemented analysis and updating of regulations if this follows from the analysis conclusions	MZI / MOP, MZ … analysis MOP / MZI, MZ ... updating	2021 (analysis) 2022 (updating)
Drafting guidelines	Draft guidelines for the treatment of environmental noise in spatial planning and construction.	drafted guidelines	MOP / MZI, MZ	2020
General and specific acts	Consider environmental noise in issuing environmental approvals, environmental permits and integral building permits. Consider noise in the preparation of national and municipal planning documents.	issued EPs adopted acts	MOP / MZI, MZ	ongoing task
Environmental noise monitoring	Implement operational monitoring for noise sources.	implemented operational monitoring	managers of noise sources	ongoing task

Environmental noise analysis	Update strategic noise charts for important roads, important railroads and areas of the Maribor and Ljubljana municipalities.	updated strategic noise charts	road and railroad managers, municipalities / MOP	2024 and 2029
Planning of measures	Draft operational programmes of protection against noise for important roads, important railroads and areas of the Maribor and Ljubljana municipalities.	drafted operational programmes	MOP / MZI, MZ, Ljubljana Municipality, Maribor Municipality	2020, 2025 and 2030
Examination of appeals	Examine the possibilities and benefits of establishing a system for addressing citizen complaints. Establish the system if it proves appropriate.	drafted scientific bases, an established system if it proves appropriate	MZ	2025

The implementation of measures for environmental noise protection will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7.3 Biosafety

Current situation and challenges

Biotechnology is considered to be one of the fastest growing life sciences on a global scale. Rapid progress in this field enables the development of new technologies and activities in almost every sector. Recently, the intensive inclusion of biotechnological processes in other technologies poses an additional challenge as well as addresses new political and legislative topics. The rapid development of the field has brought more and more biotechnological products, including genetically modified organisms (GMOs), into the market. Slovenia does not yet have a comprehensive action plan in biotechnology, which hinders the preparation of specific initiatives in this field and the access to funding sources, although the rapid development of biotechnology and GMOs brings new opportunities and solutions in innovation, sustainable economic development, climate change, food production, health, environment and other areas also in the Slovenian environment.

Slovenia established its biosafety system in modern biotechnology in compliance with the precautionary principle which is based ontransparency, a step by step approach and on a case-by-case basis risk assessmen. The measures are in place to prevent and reduce potential adverse effects on human health and the environment that could occur during contained use of GMOs, deliberate release of GMOs into the environment and placing them on the market. In Slovenia, the activities in modern biotechnology are most intensive within the framework of research in contained use system and, to a negligible extent in deliberate release into the environment. Activities often target medical science and human health.

In parallel with the development, there is a growing awareness of social, ethical, health and legal aspects of the use of biotechnology, which are important components of environmental awareness in Slovenia as well as globally. The attitude of Slovenia's experts and the general public is less critical of modern biotechnology and GMO products in the field of medicine and human health, and more critical in the field of agriculture and food production – despite the fact that only safe organisms are used, their safety assessed in safety/risk assessments completed in the licence granting procedure.

Goals in biosafety

Measures in biosafety will support:

- maintaining an effective and transparent biosafety system,
- providing effective protection of biodiversity and prevention of potentially adverse effect on the environment, human and animal health and plants,
- Slovenia to be a society of highly responsible practices involving modern biotechnology products at all levels (in consumption, use, production, research, development and innovation),
- preserving favourable social and economic effects of modern biotechnology and its products.

Guidelines and measures for achieving the goals of biosafety

Rapid development and innovation and new activities in biotechnology and GMO require the constant upgrading and supplementing of the established biosafety system and its legislative and regulative framework in order to efficiently endure a safe application of new technologies and its products and prevent and mitigate potential short- and long-term adverse effects on the environment, biodiversity and human health. Slovenia should seek solutions ensuring the safe use of new technologies and activities in biotechnology (e.g. new variety selection techniques, CRISPR-Cas9, synthetic biology). Especially sectors and ministries important for research and development, human health, agriculture and food production and industry should be intensively involved in ensuring biosafety.

The goals will be achieved by using measures listed in Table 8, which necessitate interdisciplinary and interdepartmental approaches to biosafety and modern biotechnology products.

Table 8: biosafety measures

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Progress monitoring	Periodically overview the progress of modern biotechnology and its products at the EU and global levels, and evaluate the potential impact on Slovenia. Draft the Action Plan for a broader field of biotechnology (based on the findings of overview and evaluation).	completed overview and action plan	MOP / MIZŠ, MKGP, MZ, MGRT	2025, then ongoing task
Systemic measures	Maintain and update the biosafety system as a whole, including its central part –	functioning biosafety system	MOP, MKGP, MZ, MGRT	ongoing task

	environmental and human health risk assessment – if so required by the developments in biotechnology.			
Monitoring	Implement control measures and monitoring to ensure the safe use of modern biotechnology and its products.	implemented control measures and monitoring	MOP, MKGP, MZ, MDDSZ	ongoing task

The implementation of biosafety measures will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7.4 Management of chemicals

Current situation and challenges

The field of chemicals is very broad and may be divided into specific fields especially in terms of their use, which may differ. Furthermore, chemicals also have different properties. The data or information that contains the findings of hazardous properties for individual chemicals and their management are still a challenge at European Union and international levels. Hazardous properties are the basis for seeking suitable and effective measures for managing environmental risk caused by their presence. Recently, particular emphasis has been placed on hormone disrupting properties, and progress has been made in this field.

The field of chemicals is regulated by legislation at the EU level (European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (hereinafter: the REACH regulation) the Classification, Labelling and Packaging Regulation (hereinafter: the CLP regulation), and regulation governing biocidal products), which Slovenia's legislation follows. Besides legislation, strategies are adopted at the EU level. These include the Plan for Substances of Very High Concern whose aim is to have all relevant substances of very high concern included in the candidate list by 2020, which is the basis for the further authorisation of chemicals. The Sustainable Chemicals Policy Strategy of the Union has been adopted, serving as the basis for the implementation of measures.

The implementation of EU legislation and international conventions in the field of chemicals is a key challenge for Slovenia, as they include numerous and complex procedures that are not yet implemented effectively enough.

The field of chemicals is also related to the field of waste; the two are increasingly overlapping and Slovenia has not yet resolved the issue of criteria regarding end-of-waste status. There is also no adequate traceability, both in Slovenia and at the EU level, of which substance hazardous waste contains, which is a challenge for planning measures to prevent chemical pollution in the environment.

Chemicals are also an important element of the circular economy, especially with regard to substances of very high concern, other substances subject to a ban, or substances contained in electrical and electronic equipment.

Goals concerning the management of chemicals

The measures for the management of chemicals will achieve the following goals:

- reduced burden of chemicals for the environment and consequently reduced exposure of the population,
- abolition of use of chemicals of very high concern and promotion of development of less hazardous alternatives, materials, products and technologies.

Measures for achieving the goals concerning the management of chemicals

Table 9: measures concerning the management of chemicals

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Impact on the management of chemicals in the EU	Control health and environmental risks by introducing and implementing cost-effective measures for the management and use of chemicals.	adopted measures	MZ-UKem	ongoing task
Capacity-building	Build capacities of competent authorities and liable persons for the effective implementation of legislation and commitments arising from international conventions in hazardous chemicals, and implement other EU strategies, build the capacities of the Chemicals Office of the Republic of Slovenia (MZ-Ukem) as the central competent authority for chemicals and biocidal products, include the MZ-Ukem and other experts in the work of expert and other authorities at the European Chemicals Agency and European Commission and other important international programmes and conventions, establish a uniform system of assessment of biocidal products, plant protection products and chemicals in Slovenia, provide professional support and counselling for the education and training of the industry.	implementation of the REACH Regulation	MZ-UKem	ongoing task
Monitoring	Monitor the exposure of the environment and population to selected chemicals in the framework of periodic programmes of biological and other types of environmental monitoring.		MZ-UKem MOP	ongoing task
Systemic measures	Establish inter-ministerial cooperation for the effective and harmonised treatment of important content regarding the management of chemicals. Ensure comprehensive and systemic consideration of issues related to chemicals		MZ-UKem / other line ministries	ongoing task

	and the environment. Strengthen the cooperation of scientific research institutions and involve experts in the processes of chemical management and in the implementation of research projects.			
Awareness raising	Raise awareness of consumers and users and other target groups about the safe and responsible use of chemicals and products and their handling.	Completed activities.	MZ-UKem	ongoing task
Administrative procedures	Gradually introduce the principle of green chemistry and the use of safer alternative substances and state-of-the-art technologies in industrial plants in the administrative procedures for issuing environmental approvals (EA) and permits (EP).	Issued EA and EP.	MOP-ARSO	ongoing task
Circular management of chemicals	Introduce elements of the circular economy for the reuse of substances (chemicals) and reduction of their waste.		MZ-UKem, MGRT, MOP.	ongoing task

The implementation of measures for the management of chemicals will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7.5 Burdening the environment with electromagnetic field

Current situation and challenges

Electromagnetic field (EMF) sources are present everywhere in natural and residential environments. Humans are exposed to EMP loads from natural and artificial sources in the frequency range between 0 and 300 GHz. In comparison with the natural electromagnetic field, the intensity of artificially created fields has increased greatly, as the scientific and technological revolution continues inexorably and we are faced with new sources that use different parts of the electromagnetic spectrum.

Environmental regulations and regulations related to health and safety at work govern the following EMF sources:

- power lines, transformers, radio and television transmitters, mobile telephony base stations, radars and similar telecommunications devices which may constitute a constant source of burden on the population, depending on the distance of the EMF source, and
- industrial transformers, induction furnaces and welding devices, and, in the electricity generating industries, generators in power plants that cause a locally increased EMF burden.

People are also exposed to the following sources:

- daily impact of EMF caused by household appliances, television sets, computers, mobile phones, power tools and similar electronic equipment for home use – the safety requirements for these devices are governed by industry standards;

- occasional effects of EMF in the use of medical devices that use extremely low-frequency EMFs, such as for bone growth stimulation, pain relief, treatment and diagnosing – although EMF burdens are high here, the positive impact of medically controlled use of these EMF sources is greater than the negative impact.

Siting of new EMP sources (e.g. mobile telephony base stations and high-voltage power lines) near residential facilities seems to be the biggest challenge, as it causes discomfort and outrage among the population, which is mainly due to lack of public information on the contribution of individual EMF sources to total burdens.

Another challenge is unresolved issues concerning the burden of EMF, namely the local excessive burden of EMF on the population, as they are not addressed by regulations.

Goal concerning burdening the environment with electromagnetic field

The measures of protection against burdening the environment with electromagnetic field will:
- increase public awareness about burdening with EMF,
- ensure the consideration of EMF, taking into account scientific knowledge.

Measures for achieving goals concerning burdening the environment with electromagnetic field

Table 10: measures for controlling the burdening of the environment with electromagnetic field

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Legislative	Update the regulation dealing with EMF in the natural and living environment, especially regarding the first measurements and operational planned monitoring for EMF sources and the conditions for its implementation, regarding the limit values of permissible EMF exposure and the establishment of databases of burdening of the living environment with EMF sources.	updated regulation	MOP	2022
Provision of information	Establish a register of EMF sources containing the location of sources and their burdening of the environment.	established register	MOP / AKOS	2021

The implementation of the measures for controlling the burdening of the environment with an electromagnetic field will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7.6 Light pollution in the environment

Current situation and challenges

Light pollution in the environment is the emission of artificial light sources increasing the natural illumination of the environment so as to cause disrupting illumination and the sense of glare to the human eye and endanger traffic safety, while direct or indirect radiation towards the sky interferes with the life or migration of birds, bats, insects and other animals, and at the same time unnecessarily consumes electricity by emitting radiation towards the sky.

Slovenia is one of the few countries regulating the area of light pollution at the national level, namely by the Decree on Limit Values of the Light Pollution in the Environment (Official Gazette of the Republic of Slovenia, Nos 81/07, 109/07, 62/10 and 46/13). The situation regarding light pollution in the environment has improved in recent years. Data from municipalities show that the share of municipalities with excessive electricity consumption (according to the restrictions set by the regulation) for lighting municipal roads and public areas has decreased (46% in 2009, 26% in 2018). Greater, although still insufficient, progress has been made with regard to the use of inadequate lamps that emit a luminous flux upwards through horizontal. In the municipalities that sent lightning plans to the Ljubljana Municipality, the share of inappropriate lamps has been reduced from 72% to 15% in the period from 2009 to 2018.

Light pollution is increasingly burdening the environment, especially through the installation of light sources on advertising facilities in settlements. This can have a disruptive effect on drivers and thus on road safety, and over-illuminate the windows of facilities where people are present. The lighting of road infrastructure outside settlements or in areas where a higher density of pedestrian and cyclist traffic is not expected is also increasing. The new technological development of energy-saving lamps has a positive impact on energy consumption for lighting, but this saving, in accordance with the regulation governing energy consumption per unit area or per capita, on the other hand leads to the installation of more lamps, resulting in greater environmental illumination.

Goal concerning light pollution in the environment

Measures for controlling light pollution will reduce light pollution in Slovenia's settlements and areas outside settlements.

Measures for controlling light pollution

Table 11: measures for controlling light pollution

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Legislative	Amend the regulation governing light pollution using a photometric quantity instead of the average electric power of lamps per unit area, and introduce a multi-stage system of measures to reduce light pollution, such as switching off road lighting taking account of traffic safety, and switching off lighting in advertising facilities.	amended regulation	MOP	2023

Public procurement	Periodically update (in accordance with the development of technology, market and knowledge) the existing goals, requirements and criteria of public procurement concerning light pollution.	implemented updates	MOP / MJU	ongoing task

The implementation of the measures for controlling light pollution will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

7.7 Climate change adaptation

Current situation and challenges

Changes in climate variables are particularly evident in Slovenia. The most striking aspect of this is the rise in air temperature (the average annual temperature rose by 1.7 °C in the 1961–2011 period), and there are considerable changes in precipitation patterns and an increasing number of extreme weather events.

The impacts of climate change will further increase as climate projections show that the warming in Slovenia will continue. Projections for changes in recipitation patterns are uncertain but show that the quantity of precipitation will increase in winter and possibly decrease in summer. At an annual level, the projected changes show significant anomaly compared to present climate in the second thirty-year period (2041–2070), when the amount of precipitation will strongly increase in the eastern half of Slovenia.

These changes will have multiple and diverse consequences. It is a comprehensive challenge to recognise and assess the scope and type of climate change impacts on individual activities. Strong interconnections between individual sectors (e.g. water and biodiversity) and other influencing factors, such as land use and urbanisation, and population growth and aging, add to the complexity. Aadding to the complexity is the uncertainty about the success of limiting GHG emissions and adapting to climate change in neighbouring countries, regions and globally.

According to assessments in the World Economic Forum Global Risks Reports, the failure to mitigate and adapt to climate change is the risk with the highest impact in the future.

The importance of adaptation to climate change is recognised at the international level by the adoption of the Paris Climate Agreement, the Sendai Framework for Disaster Risk Reduction 2015–2030, the 2030 Agenda, and the EU Strategy on Adaptation to Climate Change.

The progress achieved in climate change adaptation will strongly affect the development of Slovenia.

Guidelines for the actions of stakeholders in achieving the goals are set out in the already adopted Strategic Framework for Climate Change Adaptation. They emphasise the importance of integrating the impacts of climate change into the planning and implementation of all activities, wider cooperation, continuing research and knowledge transfer, and

education, training, awareness-raising and communication, and in particular financial support for these policies. In addition, adaptation policies and measures will be included in the long-term climate strategy.

It is particularly important to take the impacts of climate change into account when undertaking development and spatial planning, to integrate and exchange experience and good practices, and to continuously improve the knowledge on climate change impacts and ways of adapting to climate change. Resilience could significantly improve by achieving an appropriate level and quality of education, competence, awareness, information and broader communication about climate change impacts. The target public should be made aware of the impacts of climate change on society.

Goals concerning climate change adaptation

Climate change adaptation measures in Slovenia will reduce the exposure to the climate change impacts, sensitivity and vulnerability, and increase the resilience and adaptive capacity of society.

Measures for achieving goals concerning climate change adaptation

Slovenia has adopted the Strategic Framework for Climate Change Adaptation and established the Cross-sectoral Working Group on Climate Change Adaptation with the task of systematically steering activities (including measures from Table 12) on the basis of monitoring progress.

Table 12: measures for achieving goals concerning climate change adaptation

Type of measure	Measure	Measure indicator	Responsible institution	Time limit
Provision of information	Offer climate services by providing and disseminating information on the state of climate and anticipated changes of climate adapted to the needs of users (sectors, public, researchers) and in an user-friendly form enabling simple further use.	functioning information point	MOP – ARSO	ongoing task
Planning and steering of activities	Vulnerability assessment by municipalities	assessments, strategies, plans, guidelines made	MOP – ARSO	2021
	Municipal strategies on adaptation		municipalities	2022
	Vulnerability assessment by sector		sectors	2020
	Action plans of adaptation measures		MOP	2022
	Guidelines for climate change impact assessment in administrative procedures		MOP	2020

The implementation of the measures for climate change adaptation will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

8 SUPPORTING MEASURES

8.1 Better regulation and better application of legislation

A quality and effective legal framework should be provided in order to achieve the goals of environmental protection and nature conservation and water management. It will be necessary to ensure the transparency and clarity of regulations and their harmonisation, and monitor their effectiveness. To this end, it is necessary to streamline the system of environmental regulations at the implementing level, where the rapid transposition of European directives was the principal reason for a large number of regulations that could be partially merged in order to reduce their quantity.

The regulations should reflect the latest scientific findings, experience of administrative and other stakeholders of environmental protection and related areas (for instance health), and should be suitable for their purpose. It should be ensured that the complexity of legislative arrangements is proportional to the scope and characteristics of the environmental challenge, and that regulations address the challenge in a cost-effective manner.

In order to improve the implementation of the legislation, it is necessary to ensure an effective inspection system that will act preventively to reduce the violations of regulations and also curatively to eliminate violations as soon as possible.

To improve the efficiency of the inspection system, the following will be required:

1. a sufficient number of qualified inspectors;
2. a clearer delimitation of competences between different inspection services at the national level and between national and local inspection services;
3. improvements to the enforcement procedure by:
   - earmarking resources for enforcement procedures by another person when advance payment from the funds of liable person is not possible,
   - ensuring the systemic regulation of enforcement officers for areas where this is not yet regulated (e.g. public services for waste management, water regulation);
4. improving the planning of inspections (the goal being to carry out 60% of inspections as regular inspections):
   - clearly identifying liable persons subject to regular inspection,
   - taking account of the risk assessment;
5. improving the qualifications of inspectors:
   - for supervising complex content such as larger-scale pollution and larger accidents involving hazardous substances,
   - by enhancing the legal service of the inspectorate;
6. by implementing more education and training and strengthening the exchange of experience and transfer of knowledge at the national and international level also by participation in the IMPEL programme;
7. updating software (for the planning and supervision of work) and hardware by light laptops with a long-distance connection, and providing a mobile office;
8. more specific regulation of bases and content for a better implementation of inspection in the preparation and revision of environmental regulations;
9. better implementation of minor-offence procedures by imposing fines within a range in relation to regulations;
10. strengthening links and better cooperation with supervision services (nature protection supervisors, river supervisors) and inspectorates of other ministries.

The improved implementation of environmental legislation will also need to be ensured through better qualifications of civil servants to conduct administrative procedures in environmental protection and related areas, such as the issuance of building permits. These

qualifications include, in particular, the social skills required to act in relation to ancillary participants in the proceedings (natural persons, civil initiatives, non-governmental organisations) and the ability to ensure public participation in administrative proceedings in accordance with international conventions and regulations.

In order to improve public participation in the preparation of environmental regulations and other environmental documents, it will be necessary to prepare a manual and conduct practical workshops that will make the cooperation effective and to the benefit of finding the best solutions and to the satisfaction of all participants.

It will be necessary to examine the possibilities for improving the MOP website to provide information on the drafting of regulations, national spatial plans, strategic environmental impact assessment procedures and to guide public participation in the preparation of regulations and in administrative procedures.

8.2 Improved access to environmental data

It is crucial for persons implementing and using environmental legislation to have an access to environmental data, which provides an overarching overview of the area, as well as the links between environmental protection, nature conservation, water management, spatial planning and other related areas. It is crucial to present the connection of administrative procedures in environmental protection, spatial planning and construction with detailed information for individual contents of environmental protection.

This requires the ministry to have an informative website containing transparent environmental information targeting investors, general public, non-governmental organisations and municipalities.

A greater effort will have to be made towards issuing publications supporting the activities of environmental protection stakeholders.

Better care will have to be taken to clearly present the paths of legal protection of the rights of non-governmental organisations and citizens to exercise their right to a healthy living environment.

8.3 Improvement of the knowledge base and database for environmental policy

In order to make environmental policy more responsive to complex environmental and societal challenges, it is necessary to ensure in particular:

- environmental monitoring,
- analysis of impacts of local, regional and global patterns of change in areas important for the state of the environment,
- larger contribution of results of research programmes (at the national and EU levels) to eliminating knowledge gaps,
- competences for the assessment of social and economic effects of the environmental policy in order to better demonstrate its benefits for society.

Regarding the monitoring of the state of the environment, it will be necessary to review the adequacy of the established system of environmental indicators and update it in order to enable the monitoring of the state of the environment and the effectiveness of measures to achieve environmental goals.

To assess the impact of local, regional and global patterns of change on the state of the environment, tools will need to be provided to model complex environmental change

issues such as climate change, the consequences of species or habitat loss for ecosystem services, the risks of crossing critical points and planetary capacity limits.

It will be necessary to ensure the better use of EU institutions specialising in the transfer of scientific knowledge to technical support for public policies, such as the European Environment Agency and the European Environment Information and Observation Network.

More attention will have to be devoted to the consideration of:

- interactions of environmental, social and economic factors,
- cross-sectional areas (such as water – food – energy – ecosystems) with the aim of harmonising different interests,
- costs and benefits or environmental protection measures for society and the failure to act,
- patterns of sustainable consumption and production, and the contribution of behaviours of individuals and society to environmental results,
- uncertainties regarding the impact of environmental pollution on health and a better understanding of environmental factors and levels of exposure affecting human health.

The improvement of the knowledge base for environmental policy will also require the systematic identification of knowledge gaps, seeking appropriate research programmes for their addressing and long-term planning of the contents of environmental research, including by taking account of the review of the current situation and challenges in research and development related to environmental goals: Detailed review of the situation and identified challenges in research, development and innovation related to environmental goals – scientific bases.

8.4 Integration of environmental protection goals in policies of other sectors

The achievement of this programme's goals requires data and records necessary for the planning and implementation of other sectors' policies.

The achievement of the goals of this programme will not be possible without the support of other policy measures, in particular the policies of key systems such as mobility, energy, agriculture, forestry, food, health and housing system. It will be necessary to improve the sustainability of these systems, which will be achieved by decarbonising them, increasing their resource efficiency and adapting their operation to the vulnerability and boundaries of ecosystems. Financial, education and research policy will have to follow these principles as well.

It is important that environmental policy goals are integrated into other policies and that these policies steer social development towards a sustainable low-carbon society in limited natural and environmental conditions. The assessment of environmental impacts of these policies' programmes and plans is crucial, for which a mechanism of strategic environmental impact assessments has been established, which, in aggravated environmental conditions and climate crisis, is becoming a key tool for assessing the environmental sustainability of planned actions before a final decision is made. In order to carry out a strategic environmental impact assessment, persons drafting environmental reports and decision-makers must have expert bases and guidelines that take into account the state of the environment, the latest scientific findings and nature protection, environmental and climate goals, and must be continuously trained.

Environmental, nature protection and water management aspects will need to be integrated more effectively into development and spatial planning and the planning of other policies to implement coordinated and integrated measures for reducing environmental pressures. In doing so, it will be important to ensure that important actions of other ministries

are addressed at an early stage in their planning and that their combined effects on the goals of this programme are examined. Since spatial planning is the point in time where different development and protection interests in a certain area meet, it is important to make strategic development and protection content as compatible as possible in terms of feasibility and thus prevent any conflict at the level of implementation. This coordination should take place through effective inter-ministerial communication in the preparation of the strategic development and protection content of policies, and later through instruments of spatial strategic and operational planning, through which protection and development interests of policies can be realised.

Above all, communication and spatial planning must be based on comprehensive professional bases developed by taking into account the latest scientific findings and good practice.

8.5 Strengthening dialogue and cooperation

The achievement of environmental protection goals in an effective way by exploiting the synergy effects of environmental stakeholders will require the strengthening of dialogue, understanding and cooperation between state and local government bodies, non-governmental organisations in environmental and nature protection, the Ombudsman, professional institutions, media and the general public. The implementation of measures shall be organised in a way enabling the effective use of the capabilities of stakeholders, i.e. the distribution of the implementation of measures among stakeholders according to their knowledge and skills.

The key condition for the achievement of the programme's goals will be the support of non-governmental organisations in environmental protection and nature conservation, so that their capabilities can be used to achieve the programme's goals and these organisations can act in accordance with competences and responsibilities provided by national regulations and international conventions. It will be necessary to ensure a systematic, open and substantively rich dialogue or cooperation between NGOs and administrative bodies, and to raise awareness of the benefits of involving NGOs in policy-making and public service delivery processes. It will be necessary to examine the possibilities of a greater contribution to achieving the goals of the NEAP 2020–2030, which can be provided by horizontal and substantive NGO networks. With regard to substantive networks, the possibility of strengthening the role of a network well-qualified in terms of expertise and communication as a mediator in the face of conflicting interests of the wider and partial public interest should be explored, especially with a view to strengthening a culture of constructive, inclusive and tolerant dialogue. It will also be necessary to examine the possibilities and use NGO capacities to perform certain supporting public functions, such as the management of small funds, awareness-raising, informative and educational activities and supporting analyses for the better management of specific environmental protection topics, and formally regulate the transfer of public functions. Priority should not be given to the training of networks but to their further strengthening in particularly exposed areas.

A key condition for the use of NGO capacities is the financing of NGOs in a manner and to the extent that will enable the continuous and systematic implementation of support activities for environmental protection. To this end, the possibility of programme-based financing should be examined and project-based financing carried out in a way enabling the greater role of NGOs in setting goals and selecting the manner of project implementation. Possible ways of supporting NGOs in representing their views in administrative and court proceedings will have to be examined as well.

The economy expresses and asserts its interests in the field of the environment through the Chamber of Commerce and Industry of Slovenia and Chamber of Craft and

Small Business of Slovenia. As representatives of the economy and taking into account a comprehensive approach to environmental protection, the chambers participate in the forming of environmental policy and legislation, and at the same time contribute to the faster implementation of environmental requirements in practice through a positive attitude towards the environment.

It will be necessary to ensure an equal understanding of environmental challenges and the environmental protection system, and to this end establish a more permanent form of cooperation between the competent ministry and institutions that can contribute to better effects of environmental legislation, such as the Ombudsman, judiciary and media.

8.6 Education for environmental protection

Education for environmental protection is a part of a broader concept of education for sustainable development. “Education for sustainable development (hereinafter: ESD) and active participation in a democratic society, including in-depth knowledge of, and a responsible attitude to, oneself, one’s health, other people, one’s own and other cultures, natural and social environments, and to future generations” is one of the main goals of education defined in the act governing the financing of education. For the implementation of this goal, Slovenia adopted the national Guidelines for Education for Sustainable Development from Preschool to Pre-university Education in 2007. The White Paper on Education (2011) also emphasised ESD, which "requires a paradigm shift in knowledge and values", while the principle of sustainable development should become "one of the key principles of education in Slovenia". It is estimated that these recommendations have not been taken into account to a sufficient extent.

More resolute efforts to achieve the sustainability goal from the act, the ESD guidelines and the White Paper commitments will also need to take into account relevant guidelines from recent key international documents and professional materials, both at the European and global levels, both in the field of sustainable development and environmental and educational policies. These include the 2030 Agenda, UNESCO Global Action Programme on ESD (2013), UNESCO GAP Roadmap for implementing ESD (2014), UNECE Strategy for implementing ESD (2005), the updated framework for implementing UNECE ESD strategy adopted at the 8th Ministerial Conference ‘Environment for Europe’ (2016), and the teacher’s manual Education for Sustainable Development Goals, Learning Objectives (UNESCO, 2017).

In environmental protection education, more decisive progress will need to be made in the future with the following goals:

- fully establish the principle of sustainable development as one of the key principles of education in Slovenia, and establish education as one of the key support systems for achieving the goals of sustainable development and environmental protection,
- empower young people and adults for working and living in a sustainable, environmentally responsible society, and for the transition to a low-carbon circular economy,
- make environmental literacy a key element of functional literacy.

The achievement of these goals will require the establishment of a systematic, professional and well-supported process for implementing the concept of education for sustainable development and for the transition to a low-carbon circular society with an integrated approach at all levels of education and training in Slovenia.

It will also be necessary to ensure that all policy frameworks, plans, strategies, programmes and processes at the national, regional and local levels include ESD as a tool

for implementing these policies and that ESD also becomes part of bilateral and multilateral development cooperation frameworks.

To improve the employability of individuals, competence for sustainable development will need to be incorporated into all professional standards and training at all levels.

The education measures are outlined in Table 13.

8.7 Research, development and innovation for environmental protection

A review of the current situation and challenges in research, development and innovation related to environmental goals leads to the conclusion that in Slovenia, as an integral part of the European innovation ecosystem, there are many but weakly interconnected mechanisms and instruments that contribute to the basic goals of this area:

- better understanding of the environment, i.e. improved knowledge base and database for Slovenia's environmental policy and the implementation of this policy through different stakeholders and at different levels,
- development and adoption of innovative technologies and non-technological innovations that will accelerate the transition to a green, low-carbon and resource-efficient economy and society.

There are also promising instruments at the EU and global level, in which Slovenia should become better involved.

As regards support in the transition to a competitive, low-carbon and resource-efficient economy and society, the Smart Specialisation Strategy addresses this long-term goal for narrower priority fields that do not, however, encompass development and innovation activities in all areas of the transition to such an economy and society.

To support the achievement of the environmental goals of this programme, Slovenia will have to achieve the following in research, development and innovation for environmental protection:

- rank among innovation leader countries in terms of indicators of environmental innovations and technologies,
- targeted investments in research and development contribute to bridging knowledge gaps,
- 60% of research contributes to sustainable development and 35% to the management and adaptation to climate change in the 2021–2030 programming period.

Measures in research, development and innovation for environmental protection are outlined in Table 14.

Table 13: measures of education for environmental protection

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
Systemic measures	Further conceptualisation of education for sustainable development, and update of the ESD Guidelines (2007).	updated guidelines	MIZŠ	2022 (updating of the guidelines), then ongoing task
	Continuation of the systematic and comprehensive evaluation of the implementation of the ESD Guidelines in all areas and levels of education by reviewing knowledge and skills. Proposals for the elimination of the deficiencies identified.	completed evaluation and further activities	MIZŠ, MOP	2021 (first evaluation), then ongoing task
	Comprehensive update of syllabi and other curricular documents and of measures providing a systemic framework for ESD.	updated syllabi and other documents	MIZŠ	ongoing task
	Updated key international documents and subject materials to be translated for the ESD area with appropriate adaptations for Slovenia and the EU.	translations available	MIZŠ, MOP	ongoing task
	Introducing principles of sustainable development and ESD in the youth sector.	completed activities	MIZŠ, Office of the Republic of Slovenia for Youth	ongoing task
	Integration pf the ESD into sustainable development related policies, plans, strategies, programmes and processes at the national, regional and local levels – similar in bilateral and multilateral development cooperation frameworks.		MIZŠ / other ministries	ongoing task
Competency for sustainable development in occupational standards	Implementation of trainings to integrate the competence of sustainable development into occupational standards and education programmes.	completed training courses	MOP / CPI, MIZŠ	ongoing task
	Integration of the competence of sustainable development into occupational standards.	integrated competencies	CPI	ongoing task
Training	Draft a training plan for the transition to a low carbon society and circular economy by defining the training needs for different target groups.	drafted plan	MOP / other ministries	2020
Provision of a support environment	Continuation of drafting and introduction of ESD implementation guidelines to support effective implementation of curricula and syllabi, and develop education establishments towards sustainable innovation ecosystems. The guidelines will constitute the basis for the preparation of learning materials and planning of development and innovation projects and will be important for teachers and school managements.	drafted and confirmed guidelines, implementation in practice	MIZŠ, MOP	ongoing task

Type of measure	Measure	Measure indicator	Responsible institution / participants	Time limit
	Establishing professional working groups for learning about the environmental aspect of sustainable development with the aim of systematic and integrated addressing of gaps and integration of updates of the field.	functioning groups	MIZŠ, MOP	ongoing task
	Reviewing, selecting and publishing professional and learning materials important for bridging the gaps in the ESD field, and carrying out training for the green economy and drafting new learning materials.	completed review, selection, publication	MIZŠ, MOP	ongoing task
	Updating of curricula and syllabi with the goals and content of ESD and a low-carbon circular economy that do not require systemic measures, and adaptations at the implementation level. Examples: development of innovative comprehensive ESD models and transfer of good practices, upgrading of annual school action plans and school education plans into comprehensive sustainable plans, increasing the number and enhancing the content of activity days, updating compulsory elective content (general upper secondary schools), updating adult education programmes, introducing interdisciplinary thematic clusters of ESD.	updated curricula and syllabi	MIZŠ	2021, then ongoing task
	Carrying out the advanced professional training of teachers, childcare workers and other professional and management staff of educational institutions. Empowering subject matter experts and advisors, teachers and other persons who bring about changes for ESD.	completed training	MIZŠ	ongoing task
	Conceptualisation and implementation of the day dedicated to ESD.	implementation of dedicated days	MIZŠ, MOP, SVRK, MZZ	2020, then every year
	Preparation of instructions for the improved compliance with the principle of sustainable development in the implementation of programmes for drawing EU funds on the basis of the Evaluation of Compliance with the Principle of Sustainable Development in the Implementation of the OP ECP 2014–2020.	cohesion policy programme indicators	SVRK / ministries	2021
	Make efforts for the integration of goals and contents of ESD and transition to a low-carbon circular economy in EU-funded programmes.	programming documents	MOP, MIZŠ / SVRK	in accordance with the timeline of drafting programming documents

Table 14: measures in environmental protection research, development and innovation

Goal	Measure	Measure indicator	Responsible institution / participants	Time limit
Provision of a support environment	Strengthen activities to support the integration of the initiative to the EU and other initiatives for studying social challenges and in international and European platforms, partnerships, network and value chains in the green economy.		ministries	ongoing task
	Establish and ensure the functioning of an information platform for an improved access to scientific and research findings addressing environmental challenges.	established and functioning platform	MIZŠ, IZUM	2020
	Establish a system for monitoring measures in research, development and innovation for addressing environmental challenges from the aspect of achieving key goals in this field and in connection with other R&D and innovation environmental protection measures. Acting in cooperation with partners and stakeholders, the MOP establishes a platform for strengthening the integration of the "environmental and sustainable" and "research, development and innovation" areas with the purpose of: – systematic and comprehensive addressing of the key challenges in environmental protection, including a joint strategic consideration for a detailed identification of knowledge gaps, – identifying appropriate instruments and activities for addressing key challenges, – contributing to the quality of bases for development and implementation of environmental policy and its stakeholders, – targeted inclusion in international platforms and programmes in key areas.	established and functioning platform	MOP	2020, then ongoing task
	Establish a mechanism to support RDI projects contributing to the achievement of the NEAP 2020–2030 goals in international or EU programmes. Make efforts to include priority environmental challenges (listed in the "project implementation" measure) as priority topics in relevant research and development and environmental programmes, with the possibility of co-financing from financial sources in environment, research, development and innovation, energy and mobility.	number of projects	MOP/MIZŠ, MGRT	ongoing task
	Effectively prepare for obtaining funds from the EU Innovation Fund, which is the key European Union measure for supporting innovations in low-carbon technologies in the next programming period.		MOP / MGRT, MzI	ongoing task
Implementation of projects	Eliminate knowledge gaps with the priority consideration of the following clusters and integrated addressing of environmental challenges: – green economy as a systemic change that incorporates sustainable transitions of social and technological systems towards sustainable production and consumption with an emphasis on systems related to food, energy, mobility and cities,	number of completed research assignments and projects	MOP / MIZŠ	ongoing task

Goal	Measure	Measure indicator	Responsible institution / participants	Time limit
	– level of biodiversity, – monitoring and assessment of the quality of air, including pollutant sediments, – research and monitoring of the soil condition from the aspect of protection and conservation of its ecosystem services, – land use from the aspect of protection and conservation of soil as a non-renewable natural source, – balancing of interests on cross-cutting issues of water – food – energy – ecosystems, – development of chemicals and alternative substances that are safer for the environment, and their introduction in practice, – crossing the environmental critical points and planetary capacity limits.			

8.8 Environmental crime

Awareness that the environment is vulnerable and that unwise actions can have very serious consequences that affect people's lives is increasingly penetrating the consciousness of the general public. In recent years, Slovenia has experienced significant events threatening health and the safety human and quality of the water.

An aspect to be considered in the case of such events is that of environmental crime or offences against the environment.

The treatment of environmental crime is also gaining ground in the EU, as ecological crime is one of the priority areas of work within the European Multi-Disciplinary Platform against Crime Threats (EMPACT) in the framework of the EU policy cycle to combat serious forms of organised international crime in the 2018–2021 period. The recommendations received by Slovenia in the framework of mutual evaluations in the EU on the topic "Practical implementation and operation of European policies for the prevention and suppression of environmental crime" are also a step towards more ambitious action in ecological crime. One of the key recommendations of the evaluators of the Council of the European Union in the report for Slovenia was the preparation of a national strategy regarding the fight against ecological crime.

Since the treatment of environmental crime includes the prevention and detection of environmental crimes and their investigation, an established system of coordinated action of all departments concerned, especially in the field of internal affairs, justice and environmental protection, is crucial for improving the state's effectiveness against environmental crime.

Due to the above, a National Strategy for the Prevention, Detection and Investigation of Environmental Crime will be prepared, with the Ministry of the Interior – Police taking the initiative and organising the cooperation of ministries in the preparation of this strategy.

The specifics of the prevention, detection and investigation of environmental crime that necessitate the adoption of a separate national strategy for tackling environmental crime are the following:

- these are crimes without a victim (the environment cannot make a report), which requires a great deal of active action in the field from all supervisory authorities,
- according to several EU research projects, the grey field of undetected cases is highest in environmental crime. Moreover, environmental crimes are often related to cases of corruption, commercial crime, tax evasion and forging of documents. Several completed investigations detected the involvement of organised criminal groups,
- interdepartmental and multidisciplinary approaches are needed when dealing with cases, as the subjects of these cases are usually demanding, requiring knowledge of environmental protection and criminal law as well as expertise for taking and analysing samples, which is the basis for possible court proceedings.

8.9 Economic and financial instruments for environmental protection

Economic and financial instruments (such as environmental charges, insurance, deposits and trading in allowances for emission) will become increasingly established as important environmental policy measures.

The introduction of economic instruments may mean a changed amount of general government revenue (e.g. from charges, taxes, excise duties) or expenditure (e.g. as a result of subsidies or loans).

The achievement of environmental protection goals is influenced by economic and financial instruments of environmental policy and other policies, especially energy, transport, agriculture and land policy. The amount and structure of these instruments influence the operation of companies and the behaviour of individuals and thus the state of the environment.

Existing tax incentives, subsidies and other incentives have been addressed in the Government Strategic Development Project P3: Green Budget Reform. The incentives of individual ministries were reviewed and an assessment was made of which incentives have negative and which have positive environmental effects. The recommendations of this project are as follows: re-updating the list of incentives, establishing a trial application of the green test and exploring the possibility of its integration in the process of preparing government materials, examining the possibility of transforming existing incentives towards their greening, and examining the possibilities for a greater impact of environmental criteria in determining vehicle tax.

The revenue from environmental tax in Slovenia is already relatively high.

Table 15 shows central government and municipal budget revenue from environmental taxes for 2016, 2017 and 2018 (rounded up to 1000 EUR) (Source: Financial Administration of the Republic of Slovenia).

Table 15: central government and municipal budget revenue from environmental taxes

Central government revenue:	**2016**	**2017**	**2018**
for CO2 emissions	132,776,000	138,802,000	138,018,000
for the use of lubricant oil and liquids	2,581,000	2,921,000	2,805,000
for end-of-life motor vehicles	24,000	-	-
for waste disposal in industrial landfill sites	279,000	248,000	199,000
for waste electrical and electronic equipment	360,000	362,000	375,000
for used pneumatic tyres	131,000	143,000	144,000
for waste packaging	769,000	817,000	627,000
for volatile organic compounds	102,000	80,000	82,000
Municipal budget revenue:			
for waste water discharge	27,089,000	23,694,000	23,385,493

The green budget reform should be conceived so as to support the transition to a green economy in a long-term fiscally neutral manner.

Well-considered green budget reform measures will support reduced environmental pollution, waste prevention and compliance with priority waste management actions, resource efficiency and the transition to a circular and low-carbon society.

Amendments to financial policy towards a green budget reform will bring wider benefits to society, as they will contribute to a healthier environment and thus reduce health risks.

8.10 Implementation of international commitments and Slovenia's contribution to the planning and implementation of international environment and nature protection and water management policy

For the state of the environment, nature protection and water management in Slovenia, it is also important to comply with international commitments and cooperate in finding solutions to challenges that are more effectively addressed through international cooperation at cross-border bilateral, regional or global levels.

Slovenia will ensure the fulfilment of international environmental commitments, including commitments regarding nature protection and water management (together with the payment of contributions and membership fees and participation in decision-making bodies) in a way that will bring international visibility and a position exceeding the political and geographical size of the country. Better account of adopted international commitments will be taken in identifying the priorities of competent authorities and in strengthening the capacities of those authorities and professional services. This will require the better involvement of administrative bodies and research institutions in the work of decision-making bodies and professional bodies in the EU and UN.

In making decisions at the international level, representatives of Slovenia will observe the following:

- adopted decisions will reflect the commitments of the 2030 Agenda,
- decision-making processes will observe the most reliable scientific findings, while the adopted decisions will increase the effectiveness of international agreements and reduce the administrative burden of their implementation (e.g. by simplifying the reporting procedure),
- decision-making processes will take into account cross-cutting issues of environmental protection, nature conservation, water management and other policies; in this context, biodiversity targets are taken into account in climate change mitigation, water protection and management,
- development aid programmes will also target environmental protection.

Slovenia will accede to international agreements on the basis of a benefit-cost assessment – with clearly defined positions and initiatives, and will ensure early involvement in the process of drafting EU Council decisions, common positions and EU regulations by concluding partnerships with EU Member States and third countries. It will also strive to achieve a more visible role in decision-making bodies, obtain a registered office of an international organisation and organise important international events in Slovenia.

The implementation of supporting measures will help to achieve the following global Sustainable Development Goals of the 2030 Agenda:

9 IMPLEMENTATION OF NEAP 2020–2030 AND MONITORING PROGRESS IN ITS IMPLEMENTATION

9.1 Assessment and source of funds, and priorities

Assessment and source of funds

In order to achieve the goals of environmental protection, nature conservation and water management, the NEAP 2020–2030 defines strategic and operational measures for which the funds needed for their implementation can be assessed, as well as measures that will be specified in subordinate programming and project documents. The assessment and source of funds for the latter will be determined in these documents.

The sources of funds for environmental protection measures envisioned by this programme are the following:

- national and municipal budgets with funds for implementing all policies contributing to environmental protection,
- funds from the already established environmental funds of the national budget (Eco Fund and Climate Change Fund) and Water Fund,
- funds of persons whose activities synergistically contribute to the protection of the environment (for example SKZG and SiDG) and extra-budgetary resources (EU programmes and funds, funds of international organisations and banks).

Earmarking funds for environmental protection will require the following:

- ensuring an increase in budgetary funds for activities in areas with a significant deficit in the past, as a priority for measures to preserve biodiversity and protect natural values,
- ensuring the transfer of part of the budget revenues from environmental taxes to the Environmental and Climate Fund intended for measures to improve the environment, in particular the rehabilitation and revitalisation of environmentally degraded areas.

The annual costs of measures for achieving goals in biodiversity and natural values are estimated at 47 to 53 million euro.

The annual costs of measures for achieving goals concerning soil are estimated at 300,000 euro. The envisaged source of funds is state and municipal budgets.

In order to achieve the goals in air quality, measures will be implemented and resources will be used as set out in these programmes until the expiration of the valid air quality programmes in areas with exceeded pollutant limit values (last amended in 2018). Future measures with the assessment of funds and their sources will be determined by the amendment of these plans and the Operational Programme for Maintaining the Best Ambient Air Quality in Slovenia, the Strategy for Smart Use of Wood Biomass in Combustion Plants and the Operational Programme for Air Pollution Control.

To achieve the goals in water management, measures will be implemented and funds will be used as identified in these programmes until the expiration of the valid plans of managing aquatic areas of the Danube and Adriatic Sea, Marine Environment Management Plan, Flood Risk Reduction Plan and operational programmes of drinking water supply and urban waste water discharge and treatment. Key measures based on water management programmes are implemented, their annual value being approximately 400 million euro. Valid water management plans also envision supplementary measures that will have to be carried out in the following years and are, based on available data regarding the status and patterns of change, estimated at about 70 million euro annually. The annual costs and sources of financing for flood risk reduction by 2021 are estimated at about 110 million euro.

Measures for achieving low carbon goals will be set out in the National Energy and Climate Plan and long-term climate strategy.

Measures for achieving resource efficiency mainly concern guidelines for the operation of national (and local) departments and will be among regular tasks of administrative bodies. As an additional measure, the establishment of a resource efficiency/circular economy hub is envisaged, whose form of organisation and mode of operation have not been determined in the NEAP 2020–2030, and therefore the funds and resources required for it have not been assessed either.

The source of funds for the implementation of measures of priority waste management and for the restoration of areas excessively polluted in the past (including underground caves) will be the funds of polluters and part of the revenue from environmental taxes.

Environmental noise management measures will be implemented to the extent and amount and with resources determined in the amended operational programmes of noise protection. Operational monitoring will continue to be covered by managers of important roads and railways and the Ljubljana and Maribor municipalities. Strategic noise maps for important roads and railways managed by the Ministry of Infrastructure will be drawn up using state budget resources. Strategic noise maps for motorways and expressways will be drawn up by DARS d.o.o. Strategic noise maps for the areas of the Ljubljana and Maribor municipalities will be drawn up by both municipalities.

Measures in biotechnology will be implemented using national budget resources and their estimated annual cost is 150,000 euro.

Measures concerning the management of chemicals will be financed with funds from the national budget.

Measures for controlling electromagnetic field radiation and light pollution will be implemented with funds from the national budget and their estimated maximum annual cost is 20,000 euro.

Climate change adaptation measures will be implemented to the extent and amount and with resources determined in the action plans of adaptation measures.

The amount of costs that will be incurred for other stakeholders (economic and non-economic entities and households) in order to achieve the goals of the NEAP 2020–2030 has not yet been estimated. It will depend on the measures to be set out in cooperation and with the agreement of stakeholders in future programmes and plans for achieving the goals of the NEAP 2020–2030.

Priorities

The NEAP 2020–2030 contains ambitious yet realistic goals, for which, taking into account the capabilities and expected development of the field, it is reasonable to expect that they will be achieved and their measures implemented in accordance with the timetable.

Notwithstanding the above, particular attention for the provision of financial and human resources will be devoted to areas that did not have sufficient financial and human resources in the past: biodiversity preservation and protection of valuable natural features, soil protection, climate change adaptation and priority methods of waste treatment.

9.2 Monitoring the achievement of goals and implementation of the NEAP 2020–2030

Monitoring the achievement of the NEAP 2020–2030 goals

Achievement of the NEAP 2020–2030 goals will be monitored by environmental and other indicators shown in Table 16. The system of environmental indicators established in Slovenia comprises over 180 indicators showing the direction of environmental development in Slovenia. They are divided into topic groups or chapters. The latter refer to environmental components (e.g. water, air), environmental issues (e.g. climate change, nature conservation, loss of biodiversity, waste management) and the inclusion of environment-related content in policies of other sectors.

Table 16: environmental indicators and other indicators for monitoring progress in the achievement of the NEAP 2020–2030 goals

Area of NEAP 2020–2030	Environmental indicators and other progress monitoring indicators
Biodiversity and valuable natural features	Environmental indicators of the NATURE AND BIODIVERSITY group: populations of certain bird species, endangered species, the conservation status of game population, underground biodiversity, plants – the diversity of species and endangered species, brown bear, compensation for animal damage, plants – invasive species, species of European importance, habitat types of European importance, farmland birds, nature areas under protection, protected areas, Natura 2000, valuable natural features. Besides environmental indicators, the monitoring of progress will use the assessments of the status of nationally important species and habitat types, the status of other invasive species and an overview of the implementation of the PUN measures.
Air	Environmental indicators: – of the AIR group: emissions of gases causing acidification and eutrophication, emissions of ozone precursors, emissions of heavy metals, emissions of persistent organic pollutants, emissions of particulate matter into the air; the sulphur content of fuels, air pollution by sulphur dioxide, nitrogen dioxide, ozone, PM_{10} and $PM_{2.5}$ particles; – of the TRANSPORT group: passenger transport demand; – of the ENERGY group: emissions of air pollutants from energy sources; – of the AGRICULTURE group: ammonia emissions in agriculture.
Soil	Environmental indicators of the SOIL AND SURFACE group: – areas degraded because of abandoned activities (the indicator will have to be upgraded so as to clearly delineate the areas with degraded soil from areas degraded for other reasons); – built-up areas (the indicator will have to be completely revised, including the title, which should, in the future, read: "Net growth of built-up land". Built-up land will have to be recorded separately (after 2020) with the purpose of activation, revitalisation or reuse); – soil quality (the indicator will be renamed to “status of soil's organic matter”, which will make the title comparable to those in international documents. This indicator will also need to be examined in terms of whether its contents need to be amended to make it an indicator of the content and quality of soil’s organic matter, possible changes in soil’s organic matter due to anthropogenic factors and the contribution to the country's carbon balance); – high natural value farmland (the indicator will be amended so as to become an indicator of biodiversity status in the soil and renamed into the “biodiversity status in the soil”, making the title comparable to those in international materials); – new environmental indicators to be established for monitoring; a. soil erosion: removal or movement of soil due to the action of water or wind, and soil erosion due to the management of agricultural and forest land, b. soil’s organic matter,

Area of NEAP 2020–2030	Environmental indicators and other progress monitoring indicators
	c. soil pollutants with locations of point pollutions or surfaces of dispersed pollutions and types of pollutants (presence of metals and/or persistent organic pollutants).
Waters	Environmental indicators for water protection and use: – of the WATERS group: water exploitation index, wastewater treatment, annual river balance, nitrates in groundwater, pesticides in groundwater, phosphorus in lakes, drinking water quality, inland bathing water quality, nutrients and biochemical oxygen demand in rivers, groundwater quality, the chemical and ecological status of surface waters, water quality for freshwater fish life, water rights, quantitative groundwater recharge, water protection areas; – of the SEA group: pollution from ships, the sea level, oxygen within the demersal layer, coastal sea bathing water quality, the chemical and ecological status of the sea; – of the AGRICULTURE group: consumption of plant protection products, consumption of mineral fertilisers, intensity of agriculture, land use change and agriculture, nitrates in groundwater and agriculture, plant protection products and their decomposition products in groundwater, irrigation of agricultural land, nitrogen balance in agriculture, agriculture in water protection areas; – of the CLIMATE CHANGE group: precipitation and temperatures; – of the SOIL AND SURFACE group: land use in water protection areas; – of the HUMAN AND ECOSYSTEM HEALTH: outbreaks of waterborne diseases, access to safe drinking water; – of the NATURE and BIODIVERSITY group: non-native species, dolphins. Environmental indicators for water regulation: – environmental indicators of the HUMAN AND ECOSYSTEM HEALTH group: reduction in the risk due to the harmful effects of water, share of the population living in flood-prone areas, reduction of the expected annual damage caused by floods; – indicators of the WATERS group: annual river balance, quantitative groundwater recharge; – results of monitoring of the amount of funds used for regular maintenance of watercourses, water facilities and water and inshore lands.
Low-carbon and resource efficient society	The ecological footprint indicator will be used to monitor the overall progress of the country. Indicators defined in the Circular Economy Monitoring Framework by the European Commission comprising ten indicators, some of which are divided into sub-indicators. Data for these ten indicators (except for food waste and green public procurement, which are being prepared) are already available in the Eurostat database, but will need to be updated in the ARSO environmental indicators. The framework indicators are divided into the following four thematic areas: – production and consumption (indicators: EU self-sufficiency for raw materials; green public procurement (as an indicator of financial aspects); waste generation (as an indicator of consumption aspects); food waste); – waste management (indicators: recycling rates (the share of recycled waste); specific waste streams (waste packaging, biological waste, e-waste etc.); – secondary raw materials (indicators: the contribution of recycled materials to raw materials demand; trade in recyclable raw materials among the EU member states and with the rest of the world); – competitiveness and innovation (indicators: private investment, jobs and gross value added; patents related to recycling and secondary raw materials).
Prevention of waste and effective waste management	environmental indicators from the WASTE group: municipal waste, landfilling, the cross-border transport of waste, direct input and domestic consumption of substances, waste management, sludge from urban waste water treatment plants, organic kitchen waste, waste batteries and accumulators, packaging waste, construction waste, waste tyres, end-of-life vehicles, waste from production and service activities, material productivity.
Restoration of areas polluted	Environmental indicators of the SOIL AND SURFACE group.

Area of NEAP 2020–2030	Environmental indicators and other progress monitoring indicators
in the past	
Environmental noise	Results of operational noise monitoring and strategic noise maps.
Biotechnology	Analyses of the number of violations regarding the safe use of modern biotechnology and its products indoors and in the release into the environment, and the results of monitoring the presence of modern biotechnology products intended for placing on the market.
Climate change adaptation	Development of a synthetic indicator enabling an insight into the situation regarding the exposure, sensitivity and vulnerability to climate change impacts and the climate resilience and adaptive capacity of society.

Monitoring of the NEAP 2020–2030 implementation

The monitoring of the NEAP 2020–2030 implementation will take place at two levels; the MOP will:

- biannually review the implementation of the NEAP 2020–2030 and progress in achieving the goals, and envisage the measures for accelerating the achievement of goals if necessary,
- make two progress reports on the NEAP 2020–2030 implementation and achieving the goals in the programming period (in 2023 and 2027) and notify the Government of Slovenia thereof. If the findings show deviations from the planned implementation of the NEAP 2020–2030 or it is likely that the goals will not be achieved, the MOP will propose appropriate amendments to the NEAP 2020–2030 or other appropriate measures.

10. STRATEGIC PLAN FOR BIODIVERSITY CONSERVATION IN SLOVENIA

The Strategic Plan for Biodiversity Conservation in Slovenia sets out measures for the implementation of long-term goals and guidelines of the NNPP in biodiversity conservation in connection with the measures of the Programme for the Protection of Plant and Animal Species, their Habitats and Ecosystems (Table 1).

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
Overall national goal A: Improve the conservation status of species and their habitats							
National objective 1: The status of habitat types (HT) and species, including genetic diversity, will be improved and/or conserved by 2030.							
Guidelines	1.1 Provide conditions for the effective preservation or improvement of the condition of HT of national and European importance.	1.1.1 Regularly perform HT mapping in Natura 2000 sites and protected areas (hereinafter: PAs).	volume of mapped areas	MOP, ZRSVN	national budget, projects	2 28	PUN GGN PRP
		1.1.2 Include in the agricultural rural development programme after 2020 (or in any amendment of the current programme) additional guidelines for the protection of HTs in Natura 2000 areas and in PAs.	volume of target areas	MKGP, MOP	national budget	6, 9, 11, 15	
		1.1.3 Improve the fulfilment of the specific requirements of some specialised Natura 2000 qualification HTs in forest management.	status of specialised qualification HTs	ZGS, ZO, ZRSVN	national budget	6, 8, 15, 17, 48	
	1.2 Identify, as a matter of priority, HTs in Natura 2000 areas that need to be improved or re-established, and determine the most suitable areas for this.	1.2.1 Identify the degree of threat to HTs – make a red list of them.	adoption of new rules	ZRSVN, ZRS, PA managers	national budget	3	
		1.2.2 Increase the scope of use of contractual protection and custody mechanisms for the needs of protection of rare and endangered HTs.	increased volume of areas under contractual protection and custody	ZRSVN, ZRS, MOP	national budget	18	
		1.2.3 Integrate specific measures for the conservation of endangered HTs in all programmes and plans governing	share of adopted plans that include measures for the	MOP, ZRSVN	national budget	15	

National objectives and guidelines	Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
	the management of natural resources and spatial planning.	conservation of endangered HTs				
1.3 Ensure improvement of the status of species from the Red List in the Republic of Slovenia and qualification species of Natura 2000 areas.	1.3.1 Make inventory of the status of species and later monitor it and update the Red List.	adoption of new rules	MOP, ZRSVN, ARRS	national budget, projects	3	
	1.3.2 Update the Decree on Protected Wild Animal Species and the Decree on Protected Wild Plant Species (based on the updated Red List).	adoption of updated decrees	ZRSVN, ZRS, ARRS	national budget, projects	3	
	1.3.3 Draft and implement action plans for ensuring a favourable status of the most endangered groups/species.	number of plans adopted, activities implemented, status of species concerned	MOP, ZGS, ZRSVN, ZRS, PA managers	national budget, projects	6	PUN
	1.3.4 In forest management, improve the fulfilment of the specific requirements of some specialised Natura 2000 qualification species that need it.	status of specialised qualification species	MOP, MKGP, ZRS, PA managers	national budget	6, 8, 15, 17	GGN
	1.3.5 Broaden the supervision of the factors threatening biodiversity (hereinafter: BD) in Slovenia.	status of specialised qualification species	MOP, MKGP, MZI, PA managers	national budget, project	40	
	1.3.6 Identify and maintain and, if necessary, re-establish ecological links that allow for genetic exchange between populations.	number and share of implemented projects	MOP, ZRSVN, ZGS, PA managers	EU funds and programmes	12, 14, 44, 45	
1.4 Ensure the preservation of local breeds and varieties.	1.4.1 Expand the breeding and use of local breeds of domestic animals in order to preserve genetic diversity in agriculture.	number of breeds and animals and number of breeders, respectively	MKGP	national budget, projects	Regulated in detail by the implementation of the animal and plant gene bank in agriculture	
	1.4.2 Increase the surface area for growing local plant varieties.	surface area	MKGP	national budget, projects		

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
		1.4.3 Promote local breeds and varieties.	awareness of the population	MKGP	national budget, projects		
	1.5. Ensure the maintenance and updating of the biological safety system.	1.5.1 Maintain and update the biological safety system.	active supervision of GMO in our environment	MOP	national budget, projects		NEAP 2020–2030/ Chapter 7.3
		1.5.2 Maintain the prohibition of growing genetically modified organisms.					
		National objective 2: By 2030, agriculture, forestry, water management and aquacultures will increase the inclusion of the protection of species and habitats of Slovenian and European importance in their programmes and plans.					
Guidelines	2.1 Include in agricultural strategies and rural development programmes quantified BD conservation goals tailored to regional and local needs and aligned with the professional findings.	2.1 1 Protect the agricultural landscape by agricultural policy mechanisms and by raising the awareness of farmers.	volume and share of areas	MOP, ZO, ZRSVN, MKGP	national budget	6, 17, 36, 38, 46	PRP, PUN
		2.1.2 Manage grass HTs in a way adapted to geographical units.	scope of grasslands covered by rural development measures	MOP, MKGP; ZO, ZRSVN	national budget, projects	2, 6	
		2.1.3 Promote extensive pasturing in areas where pasturing has been abandoned.	pasture surface areas	MOP, MKGP, ZO	national budget	2, 6	
		2.1.4 Conserve, establish and maintain margin habitats (e.g. hedges).	actual use	MKGP, MOP, ZGS, ZO, MKGP	national budget	6	
		2.1.5 Consistently implement the supervision of compliance with the ploughing ban.	volume of reserved areas	MKGP, MOP, ZO, MKGP	national budget	6, 40	
	2.2 Intensify the measures for conserving BD in forest management programmes and plans.	2.2.1 Determine particularly valuable habitats for animals of forest environments or eco-cells with a view to conserving biodiversity.	eco-cell area	MOP, ZRSVN, ZGS	national budget	6, 12, 14, 18, 46	GGN
		2.2.2 Implement BD conservation measures as a priority in state-owned forests.	share of adopted plans that include BD conservation measures	ZGS, ZRSVN	national budget	6, 15, 28, 35, 44	

National objectives and guidelines	Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
	2.2.3 Declare forest reserves for the conservation of BD.	forest reserve area	ZGS, ZO	national budget	46	
2.3 Observe the principles of sustainable development and sustainable management in the operation of aquacultures.	2.3.1 Assess the capacity of ecosystems for maintaining aquacultures.	locations of potential aquacultures with capacity assessments	MOP, ARSO, ZZRS	national budget	15	NEAP 2020–2030/ Chapter 5.4
2.4 Respect the principles of sustainable management in fishery species and other aquatic organisms so as to provide that populations are restored or maintained at a level that ensures sustainability.	2.4.1. Increase the biodiversity content in the Programmes for Fish Management in Inland Waters in Slovenia.	scope of included content related to BD	ZZRS, MOP	national budget	15	PUR
	2.4.2 Establish monitoring of the distribution and status of fish species in watercourses.	population and biomass of species (monitoring), number of species or specimens caught	ZZRS	national budget, projects	28	
	2.4.3 Include scientific participation, so that an ecological approach will support a sustainable yield.	population status of fish and aquatic organisms	ZZRS, researchers	national budget	28	
2.5 Consider the principle of sustainability in water body management.	2.5.1 Ensure the continuity of watercourses – provide conditions for the free movement of aquatic organisms.	share or number of passable transverse barriers	ARSO, ZZRS, MZI, DRSV	national budget	46, 48	
	2.5.2 Consistently implement supervision of the taking and use of water.	number of reports to the inspection service and number of inspection decisions issued	MOP	national budget	40	
	2.5.3 Provide professional support to works contractors and professional supervision in watercourse regulation and riparian vegetation management.	number and share of professional supervisions, and/or on-site status of watercourses and riparian vegetation	MOP, ARSO, ZZRS, ZRSVN	national budget	39, 40	
National objective 3: INNS and their pathways will be identified by 2020. INNS and their pathways will be controlled by 2025.						

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
Guidelines	3.1 Adopt legislation on INNS and establish an interdepartmental harmonised and organised implementation of INNS-related activities.	3.1.1 Adopt legislation regulating the INNS field in detail.	adopted act	MOP	national budget	1	
		3.1.2 Establish an information system enabling access to information on INNS in the country as well as serving for communication with other countries.	a functioning website as a clearing-house mechanism	MOP	national budget	22, 30, 31, 32	
		3.1.3 Coordinate work related to INNS among sectors, as well as NGOs, local communities, experts and private companies, institutes and other stakeholders.	number of joint activities	MOP, PA managers	national budget	22	
	3.2 Achieve general awareness of the INNS.	3.2.1 Educate and raise the awareness of the general public about the issue of INNS (what they are, why they pose a problem, what every person can do, etc.).	awareness of the population	ZRSVN, PA managers	national budget, projects	37, 38, 39	
		3.2.2 Include the public in the prevention of the introduction and spread of INNS (acquire the support in and for the implementation of measures) and gathering of data on these species.					
	3.3 Provide an overview of the presence and prevalence of INNS in Slovenia.	3.3.1 Make a list of INNS in Slovenia and oversee its updating.	a reflection of the situation in nature	ZRSVN, MKGP	national budget, projects	1	
		3.3.1 Establish, in the framework of the information system, a central database of non-indigenous and non-native invasive species in Slovenia, maintain and upgrade it.	functioning database	ZRSVN, ARSO	national budget, projects	22	
		3.3 Monitor the situation (which includes the establishment of the entire system: confirmation of species, methodology, etc.).		ZRSVN, MKGP, ZZRS, ZGS	national budget, projects	22	
	3.4 Set up early detection system.	3.4.1 Set up a system for monitoring warnings and providing information, which will be supported by the system for monitoring with an emphasis on key introduction points and inspection.	number of notifications	ZRSVN, PA managers, MOP	national budget, projects	1, 22, 40	

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
		3.4.2 Set up a rapid response system when NNIS are detected or a warning regarding INNS is received (determine activities for prevention, disposal, control or keeping).					
		3.4.3 Supplement the deliberate introduction risk assessment system in cooperation with other sectors (health, the veterinary sector, customs, agriculture).	number of risk assessments	ZRSVN, ZO, MOP, MKGP, ZZV, UVHVVR, customs	national budget		
	3.5 Implement activities for controlling INNS.	3.5.1 Create and implement the system of INNS control.	special operational programmes	ZRSVN, ZO, ZGS, ZRS	national budget, projects	1, 7, 22	
	3.6 Implement measures for the restoration of ecosystems affected by INNS.	3.6.1 Establish a system of adopting measures for the restoration of ecosystems related to early detection and control systems.	Surface area of successfully revitalised or controlled areas	Owners and/or managers of lands, persons implementing measures	person introducing INNS, national budget	1, 7, 21, 22	
<u>Overall national goal B:</u> Improve the knowledge, understanding and awareness of BD and its importance at all levels of society.							
<u>National objective 4:</u> The research and monitoring of BD status will improve by 2030.							
Guidelines	4.1 Upgrade internationally comparable monitoring of status of BD indicators with an emphasis on species trend indicators.	4.1.1 Establish monitoring in selected organism indicator groups in view of professional potentials in Slovenia.	number and share of implemented monitorings	MOP, ZRSVN, PA managers	national budget, projects	28	
		4.1.2 Carry out extensive planned monitorings in pilot areas.	number of monitorings carried out	MOP, ZRSVN, PA managers	national budget, projects	28	
	4.2 Build the capacities of institutions and individuals involved in BD conservation.	4.2.1 Promote and participate in capacity building and boosting the performance and effectiveness of institutions and individuals involved in BD conservation.	number of new jobs and/or projects	MOP	national budget	35, 36,	

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
		4.2.2 Encourage the participation of volunteers in the performance of tasks related to BD conservation (citizen science).	number of volunteers involved in BD conservation	MOP, PA managers	national budget, projects	38, 39	
	4.3 Centrally coordinate and keep records on listing (inventory-making) and monitoring of BD, and transparently provide data and apply them as appropriate.	4.3.1 Establish and maintain a public central database collecting all data on publicly funded surveys and researches.	upgraded Nature Conservation Atlas	ZRSVN, MOP, ARSO	national budget	30, 31, 32	
		4.3.2 Design one of the levels of the central database so as to allow the entry of data to the broader public.					
		4.3.3 Promptly include data from monitoring in amendments to regulations and spatial planning, as well as in research on climate change.					
<u>National objective 5:</u> By 2030, BD will be better incorporated in the compulsory content of formal education, and non-formal education will improve as well							
Guidelines	5.1 Train teaching personnel responsible for presenting knowledge about BD.	5.1.1 Provide the quality implementation of programmes of formal education about the importance of BD.	number of BD-related lessons in teaching curricula	MIZŠ, ZZŠ, MOP	national budget	33, 34	NEAP 2020–2030/ Chapter 8.6
		5.1.2 Ensure the uniform technical training on biodiversity within the continuous training of employees.	number of BD-related lessons and share of teachers included, respectively	MIZŠ, ZZŠ, MOP	national budget	35, 36	
	5.2 Include BD content in natural science teaching curricula.	5.2.1 Prepare materials on biodiversity that will be included in natural science teaching curricula at all education levels.	scope of BD-related contents in teaching curricula	MIZŠ, ZZŠ, MOP	national budget	33, 34	
		5.2.2 Ensure that environmental protection and nature conservation are mandatory components of subjects involving natural science and biology and subjects involving technologies related to activities affecting the natural environment.	start of implementation of the measure	ZZŠ, MIZŠ, CPI	national budget	34	

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
		5.2.3 Ensure that the emphasis in the knowledge of BD is on the local environment.	scope of content from the local environment in teaching curricula	ZZŠ, PA managers	national budget	33	
National objective 6: By 2030, adequate information on the importance of BD will be provided to the public.							
Guidelines	6.1 Improve the provision of information to the public and introduction of new information technologies.	6.1.1 Update the clearing-house mechanism and improve the provision of information to the public.	number of website views	ZRSVN, MOP, PA managers	national budget, projects	37	
		6.1.2 Ensure, through the clearing-house mechanism, that the public is promptly informed about new developments in BD and of possibilities for participating in various campaigns and decision-making procedures related to BD conservation.					
		6.1.3 Provide the promotion of BD on the websites of public services related to BD, and the presentation of links between BD conservation and access to ecosystem services.	number of websites with accessible information on BD	MOP, ZRSVN, PA managers, ARSO	national budget	38, 39	
	6.2 Train non-school personnel who directly or indirectly deal with BD and ensure the updating of their knowledge.	6.2.1 Compose a list of professions and services (e.g. concessionaries in watercourse management) related to BD and prepare materials to be included in their training and awareness-raising.	list of professions and scope of contents	ZZŠ, MOP, CPI	national budget	33, 34	
		6.2.2 Provide quality implementation of programmes of formal education about the importance of BD for selected professions.	number of BD-related lessons in education programmes	ZZŠ, MIZŠ, CPI	national budget	34	
		6.2.3 Ensure and implement the continuous inclusion of BD content in the operation of certain occupations and services.	scope of cooperation	ZRSVN	national budget	35	

National objectives and guidelines	Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
6.3 Use existing services/networks to the greatest possible extent in education and awareness-raising (planned integration of BD into education/awareness-raising programmes).	6.3.1 Monitor the activities of services within the public sector that are related to the education/awareness-raising of various publics and, if necessary, enhance their cooperation.	number of hours that services devote to education on BD	MOP	national budget	37, 39	
6.4 Monitor public opinion on BD (in accordance with the plan for the entire NEAP)	6.4.1 Conduct a public opinion poll on BD.	public opinion polling completed	MOP	national budget		
	6.4.2 Appropriately convey the results of public opinion surveys to decision-makers at all corresponding decision-making levels.	presentation of results to stakeholders linked with BD	MOP, ZRSVN, PA managers	national budget		
6.5 Use tourism for promoting and raising awareness of BD.	6.5.1 Include BD content in tourism plans and participate in the identification of potential areas for tourism development.	scope of included contents related to BD	MOP, MGRT, PA managers	national budget, projects	37, 39	
	6.5.2 Improve BD promotion programmes for visitors to PAs and Natura 2000 areas and include them in management programmes.					
6.6 Support cooperation with and between companies and NGOs in awareness-raising, education, training and other forms of communication and in preparations for joint projects.	6.6.1 Develop a network of volunteers and volunteer programmes (participation in inventory-taking, monitoring, education), so that they can better contribute to BD conservation.	number of volunteers or completed programmes	MOP, PA managers, NGOs	national budget, projects	37, 38, 39	
	6.6.2 Organise meetings for representatives of the media, competent ministries, public services, companies and NGOs active in nature protection with the aim of finding opportunities for cooperation.	number and scope and participation of stakeholders	NGOs, PA managers, MOP, ZRSVN	national budget, projects		

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
	6.7 Acquaint the wider public about the connection between climate change and BD and effects on ecosystem services.	6.7.1 Raise the awareness of the general public regarding the impacts of climate change on BD and regarding the importance of reducing the carbon footprint for the conservation of BD and ecosystem services.	completed activities	MOP	national budget, projects	37	
<u>National objective 7: The promotion of BD and recognition of good practices supporting it will increase by 2030.</u>							
Guidelines	7.1 Recognise and develop trademarks contributing to the improvement of the conservation status of BD.	7.1.1 Promote trademarks encompassing goods, services and type of production/manufacturing.	number of products and services	MOP, MKGP, PA managers, MGRT	national budget, projects	38	NEAP 2020–2030/ Chapter 8.5
		7.1.2 Improve media relations.	awareness of the population	MOP, ZRSVN, PA managers	national budget, projects	37, 38, 39	
	7.2 Recognise and encourage companies and individuals for achievements in BD conservation.	7.2.1 Promote achievements in BD conservation and content supporting it.	public recognition of good practice providers	MOP, MKGP	national budget, projects	38	
<u>Overall national goal C:</u> Interdisciplinary cooperation, cross-sectoral integration and an integrated approach will be improved to conserve BD.							
<u>National objective 8:</u> BD content will be included in key national and local strategies and decision-making processes by 2030 at the latest.							
Guidelines	8.1 Reasonably include BD content in all strategies.	8.1.1 Ensure the inclusion of BD in programming and strategic documents.	number and/or share of strategies that include BD provision	MOP, ZRSVN	national budget		NEAP 2020–2030/ Chapter 8.4
		8.1.2 Ensure that commitments concerning BD conservation are included in sectoral action plans.	number or share of action plans that include BD provision	MOP, PA managers, ZRSVN	national budget		

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
	8.2 Include BD content in the programmes at the national level and in the national and municipal spatial planning.	8.2.1 Implement comprehensive environmental impact assessment and acceptability assessments in Natura 2000 areas and PAs for operational programmes, national spatial plans and municipal spatial plans.	number and share of plans and interventions for which assessments were made	MOP	national budget		
		8.2.2 Improve the quality of environmental reports – introduce the system of reviews/authorised persons.	number and share of environmental reports with completed reviews	MOP	national budget		
	8.3 Reduce and prevent adverse impacts of spatial-development activities on the landscape.	8.3.1 Carry out environmental impact assessments, acceptability assessments and prior procedures for public and private projects affecting the environment.	number of completed procedures	MOP	national budget		
		8.3.2 Preserve the mosaic nature of the landscape and identify landscape elements contributing to BD within spatial planning and land use.	volume of financial assets earmarked for preserving landscape features	MOP	national budget		
<u>National objective 9:</u> By 2030, existing Natura 2000 areas and PAs will be maintained through effective management and a well-integrated system.							
Guidelines	9.1 Establish a central register/database of interventions – make the identification of cumulative effects easier and more efficient.	9.1.1 Establish/maintain and upgrade the dataset enabling a comprehensive overview of the interventions in the existing Natura 2000 areas and PAs.	functioning system and currency of data	MOP	national budget	30, 31, 32	
	9.2 Enhance management groups in terms of staff and competences.	9.2.1 Participate in the promotion of the capacity-building of management groups and their regular education and training.	number of activities	MOP, PA managers, ZRSVN	national budget	36	
	9.3 Steer the development and promote sustainable models of use of physical space.	9.3.1 Adopt missing PA management plans.	number and share of management plans adopted	MOP, ZRSVN	national budget	8, 9, 11	
		9.3.2 Improve state land management to better serve BD conservation.	surface of state-owned PAs and Natura 2000 areas	MOP, PA managers	national budget	6, 17, 18	

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
<u>National objective 10:</u> By 2025, traditional knowledge, innovation, scientific bases and technologies will be integrated into the preservation of BD.							
Guidelines	10.1 Train and raise awareness of farmers for carrying out activities contributing to BD conservation in Natura 2000 areas and PAs.	10.1.1 Participate in the improvement of farmer's competencies.	share of trained farmers	KSS, KGZS, MOP, MKGP	national budget, projects	35, 37, 38, 39	
	10.2 Promote the implementation of BD research in line with national biodiversity conservation goals.	10.2.1 Implement, as a matter of priority, researches and monitoring defined in the PUN.	number of researches completed	MOP, ARRS	national budget	28	
		10.2.2 Promote the linking of research in BD and climate change and ecosystem services, respectively.	number of projects	MOP, ARRS	national budget, projects		
<u>Overall national goal D:</u> Financial incentives for BD conservation will be provided							
<u>National objective 11:</u> By 2025 at the latest, incentives and subsidies with adverse effects for BD will be identified and eliminated.							
Guidelines	11.1 Identify and monitor the impacts of incentives and subsidies (environmental payments) and transform them if necessary.	11.1.1 Abolish or transform adverse incentives and subsidies.	amount of financial resources for incentives adverse to BD	MOP, MKGP	national budget	42	
	11.2 Promote targeted payments encouraging the conservation of BD.	11.2.1 Increase the scope of incentives for private owners to implement the measures for conserving endangered HTs in Natura 2000 areas and PAs.	scope of financial incentives	MOP, MKGP, ZRSVN, PA	national budget, projects	42	
		11.2.2 Ensure incentives for the preservation of local breeds and varieties.	number of breeders and animals and surface area where local varieties are	MKGP	national budget	42	

National objectives and guidelines		Measures	Indicator	Responsible institutions	Sources of financing	Related measure from Table 1	Measure-related chapters of the NEAP 2020–2030 and other programmes
			grown				
<u>National objective 12:</u> By 2030, funding sources will be provided for research and programmes and projects that support the conservation and restoration of BD.							
Guidelines	12.1 Provide funds for sufficient funding of public services that oversee the conservation of BD, its research and the programmes that support it.	12.1.1 Provide sources for financing research activity related to BD.	budget volume earmarked for BD	ARRS	national budget		NEAP 2020–2030/ NNPP funding and Chapter 9.1
		12.1.2 Provide sources of funding that will be at least partially replenished with profits from the exploitation of natural resources.	volume of extra-budgetary funds earmarked for BD conservation	MOP	national budget		
		12.1.3 Enhance the capacities of national services overseeing BD conservation.	volume of budgetary funds	MOP, MKGP	national budget		
		12.1.4 Earmark funds for a financing mechanism of contractual protection and custodianship.	volume of budgetary and project funds	MOP, MKGP	national budget, projects	17, 18	
	12.2 Facilitate the conditions for applying to projects.	12.2.1 Provide assistance in the provision of budgetary funds.	share of successfully acquired projects	MOP, MIZŠ	national budget, projects		
		12.2.2 Improve the capacities of applicants and notify them of available projects and possible source of financing by clearing-house mechanism.	number of activities completed for improving applicants' capacities	MOP, ZRSVN, PA managers, MIZŠ	national budget, projects		

11. ABBREVIATIONS USED

AKOS	Agency for Communication Networks and Services of the Republic of Slovenia
ARRS	Slovenian Research Agency
ARSO	Slovenian Environment Agency
BAT	best available techniques
CPI	Institute of the Republic of Slovenia for Vocational Education and Training
DARS	Motorway Company of the Republic of Slovenia
DRSI	Slovenian Infrastructure Agency
DRSV	Slovenian Water Agency
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FURS	Financial Administration of the Republic of Slovenia
GGN	forest management plans
gha	global hectare
GMO	genetically modified organisms
IMPEL	European Union Network for the Implementation and Enforcement of Environmental Law
IPPC	Intergovernmental Panel on Climate Change
IRSKGLR	Inspectorate of the Republic of Slovenia for Agriculture, Forestry, Hunting and Fisheries
IRSOP	Inspectorate of the Republic of Slovenia for the Environment and Spatial Planning
IZUM	Institute of Information Science
KGZS	Chamber of Agriculture and Forestry of Slovenia
KSS	Agricultural Advisory Service
MDDSZ	Ministry of Labour, the Family, Social Affairs and Equal Opportunities
MF	Ministry of Finance
MGRT	Ministry of Economic Development and Technology
MIZŠ	Ministry of Education, Science and Sport
MJU	Ministry of Public Administration
MKGP	Ministry of Agriculture, Forestry and Food
MNZ	Ministry of the Interior
MOP	Ministry of the Environment and Spatial Planning
MP	Ministry of Justice
MZ	Ministry of Health
MZI	Ministry of Infrastructure
AKOS	Agency for Communication Networks and Services of the Republic of Slovenia
RES	renewable energy sources
UN	United Nations Organisation
PET	polyethylene terephtalate
PRP	Rural Development Programme
PUN	Natura 2000 Area Management Programme
PUR	Fish Management Programme
RISS	Research and Innovation Strategy of Slovenia 2011–2020
RRA	Regional Development Agency
SiDG	Slovenski državni gozdovi, d. o. o.
SKZG	Farmland and Forest Fund of the Republic of Slovenia
SURS	Statistical Office of the Republic of Slovenia
SVRK	Government Office for Development and European Cohesion Policy

UKOM	Communication Office of the Government of the Republic of Slovenia
UMAR	Institute of Macroeconomic Analysis and Development of the Republic of Slovenia
UNDP	United Nations Development Programme
UN ECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
URE	efficient use of energy
VITR	Education for sustainable development
ZGS	Slovenian Forest Service
ZZRS	Fisheries Research Institute of Slovenia
ZRSVN	Institute of the Republic of Slovenia for Nature Conservation
ZRSŠ	National Education Institute

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