ENVIRONMENTAL SCENARIOS 2020+

SUSTAINABLE GROWTH, BIODIVERSITY AND CLIMATE CHANGE

(SUMMARY)

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ENVIRONMENT AND TRENDS

The development of scenarios is a process based on the analysis of data and trends and also on discussion. Alternative development trajectories and possible implications are considered. Sometimes they are called "alternative worlds". It is not about an exact projection of future. It is an evaluation of possibilities about where we are headed or where we might be headed. This approach aims analyse the situation and trends in two areas of scenario development which are essential in the context of sustainable growth - biodiversity and climate change.

The first two parts offer the reader an analysis of Slovakia's objectives as defined in the framework of the Europe 2020 Strategy and related objectives on a national level. As in the field of biodiversity, opposing tendencies can also be seen in the field of climate change. The progress of some indicators is accompanied by the deterioration of others. Three possible scenarios of future development are discussed in the key part of the monograph - Scenario 1: Baseline (Progress within trends), Scenario 2: Deregulation and post-politics (Unsustainable short-term economic growth and intensification of social conflicts) and Scenario 3: Economic crisis (Reduced production and consumption). The submitted scenarios are theoretical constructs. They are based on analysis, however, at the same time they offer critical combinations of environmental, social and economic factors.

The outcomes of the analysis and scenario development indicate two opposing trends. On one hand, economic growth is separated from source consumption (a so-called decoupling). It is confirmed by indicators of energy, carbon and the source intensity of production and consumption. On the other hand, despite the crucial importance of ecosystems for the country, they are permanently threatened and degraded. The loss of biodiversity and the degradation of ecosystems and their services will most likely continue. The question is to what degree the negative trends can be slowed down and addressed. An analysis of possible future development scenarios can be perceived as a contribution to the discussion about the future public policies and measures to be adopted.

Despite Slovakia's relatively good results with regard to the reduction of emissions, better waste management and the reduction of natural resources and energy consumption, Slovakia **is lagging behind its potential** even when compared to the European leaders. The four key areas to consider as long-term trends are, according to the results of the analyses, as follows:

1. Climate change and adaptation to climate change: Despite the positive results of the local reduction of greenhouse gases emissions, Slovakia will have to face the negative impact of global changes. On one hand, this means unceasing efforts in upholding global obligations and active participation in international conventions; on the other hand, adaptation will have to be addressed comprehensively and purposefully. Further information and data about the role and importance of the ecosystem and ecosystem services in the mitigation of the impacts of climate change, adaptation to climate change, risk reduction and natural disaster prevention will be crucial.

2. *Global megatrends and biodiversity protection*: The reactions of Slovakia to global trends regarding threats to biodiversity and trends in tackling the issues of biodiversity protection are usually delayed and insufficient or are incorporated very slowly into the national strategies and concepts focusing on biodiversity protection and other issues. A systematic approach to the protection and restoration of the ecosystem and ecosystem services will be of great importance and it will be necessary to work on the relationship between biodiversity protection and social and economic aspects, reflecting values and natural capital in investment decisions, analyses of costs and revenues and further financial decision-making as well as educating public and decision-making authorities. The future targets for 2030 and 2050 should be focused on valuation and the protection of nature, a reduction in the number of species threatened by extinction and the number of habitats threatened by degradation, natural resource management enabling the effective protection and balanced and sustainable use and adoption of nature-friendly measures when addressing societal challenges such as climate change, food security, human health, standard of living and economic and social development.

3. Future work: The studies indicate that within OECD countries, Slovakia is the country most threatened by automation of production. Due to its economic structure, it depends on the situation in the iron industry and mining. As described in Scenario 2 and 3, the changes in the subsidy funding policy and/or the steel market may have strong positive impacts on environmental indicators but at the same time they may have very negative labour market implications. The segment of socially excluded communities (especially marginalized Roma communities) creates a need for local low-skilled jobs and the possible creation of so-called green jobs.

4. *Production and consumption patterns:* As described in Scenario 1, negative environmental impacts are also associated with positive approaches such as renewable energy sources, traffic solutions, etc. Therefore, the timely identification of eventual problems is essential. Another key factor is the further reduction of the utilization of natural resources and a clear vision towards a circular economy based on zero waste, electro mobility and other progressive concepts.

5. Well-governed society: The analysis indicates the importance of effective management styles able to face problems. With regard to sustainability, the relationship of Slovakia with the EU and an approach to solving conflicts between economic and environmental interests is of great importance.

The identified key factors and results of the analyses as well as a discussion about the possible scenarios provide data and information essential for considering long-term trends. Though theoretical constructs are used in the three proposed scenarios, the real analyses of the situations and trends and combinations of environmental, social and economic factors, sometimes more realistic other times less realistic, are the basis of these scenarios.

2020+ scenarios, the results of the analyses and a description of trends will be used in the further undertaken and planned projects focused on the development of scenarios and prospective studies.

SUSTAINABLE GROWTH, BIODIVERSITY AND CLIMATE CHANGE

Slovakia as a part of the European Union (hereinafter referred to as the "EU") adopts strategic objectives that in addition to policy orientation define the use of Cohesion Policy Funds. Currently they are defined by the Europe 2020 Strategy (Európska Komisia, 2010) focusing on growth, jobs and environmental issues. EU member states set common national strategic objectives for the whole EU and eventually also further individual national targets that are evaluated and updated every year in national reform programmes. The sustainable growth priority objective of the Europe 2020 Strategy is to build a low-carbon economy and to support a more ecological and competitive economy using resources in a more effective way. Two key areas where qualitative or quantitative targets are more or less determined are mitigation (reduction of greenhouse gases emissions) and the protection and restoration of biodiversity. Climate change covers a wide range of targets in the field of greenhouse gas emission reduction, the transition to renewable energy sources, energy savings and changes to the fuel mix. These targets should be supported by better resource efficiency and a transition to a low-carbon economy. With regard to biodiversity, the EU Biodiversity Strategy to 2020 document is considered the focal point. The Updated National Biodiversity Conservation Strategy to 2020 – hereinafter referred to as "UNBCS") – refers to halting the loss of biodiversity and degradation of ecosystems and ecosystem services in the EU and their conservation and restoration insofar as is feasible.

ENVIRONMENTAL SCENARIOS 2020+

The report is based on two key areas, biodiversity and climate change and their modelling, which are essential for conducting analyses of trend development and possible scenarios by 2020. An outcome of this report are 3 scenarios of possible developments of environmental trends by 2020:

Scenario 1 - Baseline (Progress within trends)

- It is based on the projection of a stable economic and social environment.
- Neither positive nor negative trends in the key indicators will change substantially.
- The main targets in the reduction of greenhouse gas emissions will be greatly exceeded, targets in renewable energy sources (hereinafter referred to as "RES") will be achieved and targets in energy savings will not be achieved.
- The key parameters of biodiversity will continue to deteriorate.

Scenario 2 - Deregulation and post-politics (Unsustainable short-term economic growth and intensification of social conflicts)

- It is based on the projection of continuous economic growth accompanied by the growth of investments posing a threat to environment.
- There is a shift towards post-policy based on the complicated search for consensus and reduced functioning of state machinery.
- The regulatory framework for environmental protection is weakened by the pressure of capital to reduce regulation and "flexibility".
- The scenario considers the possibility that the main targets in reducing greenhouse gas emissions will be greatly exceeded, RES targets will be achieved and targets in energy savings will not be achieved. Economic growth will lead to an increase in emissions, rise in housing development and dwellings having an impact on energy consumption.
- The scenario is based on a rise of conflicting areas influencing development (e.g. higher use of biomass as a climate change target versus biodiversity conservation, development of infrastructure, deterioration of status and reduction of natural habitats and landscape fragmentation without considering ecological connectivity).
- The rate and intensity of biodiversity conservation declines and this gives rise to further endangering and loss of biodiversity.

Scenario 3 - Economic crisis (Reduced production and consumption).

- It is based on the projection of economic crisis accompanied by a fall in industrial production and rise of social polarisation.
- The number of investments endangering the environment is reduced.
- There is a halt in some segments of industrial production which results in a significant change in greenhouse gas emissions due to the size of the Slovak economy.
- The worse social situation results in illegal logging, massive utilization of all natural resources and further endangering of the environment (e.g. permits for the questionable mining of mineral resources).

It is important to understand that the aim of analysis is not to show one accurate vision of the future. Instead, it presents several alternative future trajectories. They are based on analysis, however, at the same time they offer critical combinations of environmental, social and economic factors and try to

support discussion about the future. Each scenario combines more or less optimistic and pessimistic predictions for future development and deals with more but also less probable future trends.

An analysis of data and indicators leads to the conclusions that most quantitative objectives and obligations defined for Slovakia within the framework of the Europe 2020 Strategy in all alternative scenarios will be fulfilled. At the same time, the trends indicate a contradiction between a relatively high success rate in addressing climate change issues and much more negative trends in biodiversity. This is the biggest challenge Slovakia is going to face in the future and when formulating objectives for 2030.

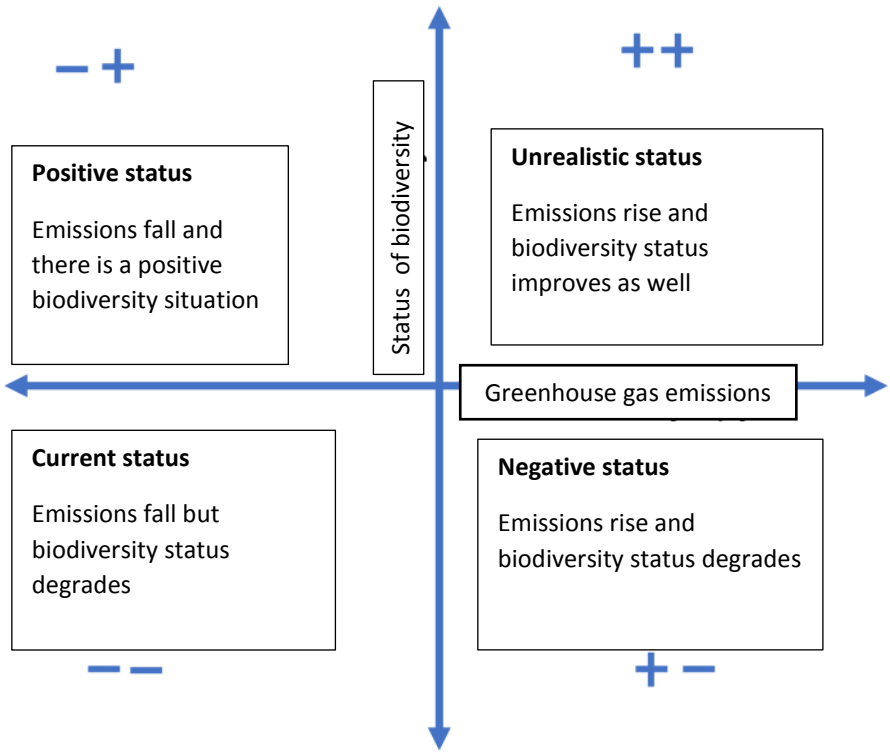
METHODOLOGICAL BASIS AND DEVELOPMENT OF SCENARIOS

Two different methodological approaches combining quantitative and qualitative approaches with a different level of participatory methods and approaches can be used for the development of scenarios. Methodological guidelines of the European Environmental Agency and approaches recommended by the European Commission's Joint Research Centre+ were used for the development of the 2020 scenarios.[1] A six steps methodology was chosen based on the critical comparative evaluation of approaches.

- Step 1: Identification of the relevant scenario dependent objectives.
- Step 2: Description and analysis of objectives in the context of Slovakia's obligations.
- Step 3: Analysis of the current condition of "managing" forces, blockers of change and triggers of changes
- Step 4: Evaluation of the significance of key forces
- Step 5: Developing scenario logic
- Step 6: Identification and elaboration of scenarios

[1] FOR-LEARN Online Foresight Guide available at http://forlearn.jrc.ec.europa.eu/guide/4_methodology/meth_scenario.htm. is kept by the Joint Research Centre. The European Environmental Agency published a methodological guide in 2012: *Using scenarios to improve understanding of environment and security issues*.

Figure 1. *Four model states used in the development of scenarios.*



CURRENT CONDITIONS, BASIS AND TRENDS

Biodiversity

Objective 1: Stop the worsening of conditions of all species and habitats covered by EU environmental laws and attain significant and measurable improvement of their conditions

Status and prognosis: The conservation of biodiversity is only slowly and insufficiently reflected and integrated in the policies of other sectors and decision-making processes. The financing of the direct management of protected areas aimed at specific measures related to individual habitats and species is not purposefully planned in the budgets and therefore cannot be assessed. Despite well prepared strategic documents in the field of biodiversity, currently there are still problems with implementation itself. The development and update of protection and conservation programs for Europe's endangered species and protected areas as well as the development and implementation of projects financed through structural funds is lagging behind and currently there is practically no national funding, which delays the implementation of proposed measures and the correct management of habitats and species. If the current trend is maintained, the loss of biodiversity and degradation of ecosystems and their services will most likely continue. This trend can be reversed by the immediate implementation of planned measures and carrying out of suitable projects aimed at practical measures for the conservation of relevant habitats and species and their full implementation in related non-departmental policies.

Objective 2: Ensure the conservation and strengthening of ecosystems and ecosystem services through the establishment of green infrastructure and restoration of at least 15 % of degraded ecosystems by 2020.

Status and prognosis: Despite well prepared documents in the field of biodiversity and the protection of ecosystems and ecosystem services, there will still be problems with their implementation. This will mainly concern the implementation of proposed measures related to blue-green infrastructure. Gradually, the approaches addressing the conservation of biodiversity and adaptation to climate change based on ecosystems and ecosystem services as well as transboundary and European attempts to create a connection through green infrastructure corridors (the Trans-European Network for Green Infrastructure - TEN-G) will grow in importance. The pressure on the ecosystem and ecosysem services in Slovakia will continue due to the increased impact of climate change but also from investors and the creation of technical elements. Most endangered ecosystems are agroecosystems and forest ecosystems in some protected areas and also water and wetland ecosystems. The introduction of the concept of ecosystems and ecosystem service protection into strategic development documents and decision-making processes, improved involvement of the public in decision-making processes and improved environmental awareness and education poses a challenge.

3.1.3 Objective 3: Maximize agricultural land to which SPP measures associated with biodiversity apply and implement forest management plans or similar instruments in compliance with sustainable forest management by 2020

Status and prognosis: A) Agriculture is one of the most important factors influencing terrestrial ecosystems and ecosystem services. The measurable improvement of the positive status of habitats and species linked to the agricultural use of the land has not been observed yet. Birds, butterflies and pollinators as well as some animal species are influenced mainly by certain agricultural practices, the use of pesticides, abandonment of traditional land use systems or on the contrary by agricultural intensification and fencing. The implementation of certain measures in agriculture can have a significant positive impact on reversing the loss of biodiversity. Agriculture depends to a great extent on common agricultural policy subsidies and rural development programme measures. If there is some misconduct related to subsidies or changes on an EU level and these subsidies are withdrawn, it can have a significant impact on the further development of agricultural land and on nature and landscape conservation. If the agricultural sector and the nature and landscape conservation sector do not cooperate, the relevant policies in both areas cannot be adequately implemented.

B) Despite the fact that pursuant to legislation, forest management activity is planned within the framework of forest conservation programs, they still have not been incorporated into other policies (nature conservation). Similarly, the application of SFM principles is voluntary and not very motivating. Without the relevant legislative changes, the current trend in forest management together with its negative impact on biodiversity and other components of the environment will continue. The improvement of forest habitat conservation and the revitalization of damaged woodlands by 2020 will not likely be achieved. An effort to use pesticides in protected areas and the ill-considered densification of the forest transport network contribute to it. A discussion about sustainable forest management in protected areas will most likely begin. The agricultural department prepared an Action Plan to the National Programme of Wood Potential Utilization in Slovakia approved by the Government, the activities of which also concern biodiversity conservation. Pursuant to this Action Plan, sustainability standards and criteria for biomass production and utilization shall be prepared, e.g. the criteria for a sustainable and adequately dense forest transport network and other activities associated with logging and timber processing that may have an impact on the status of biodiversity shall be determined.

C) River basin management plans assume that once the measures set out in the programmes of measures are implemented, the surface water bodies (hereinafter referred to as "SWB") (current status evaluated as poor or very poor) will reach the status good (i.e. the goal of the Water Framework Directive) within the planned period of 2016 - 2020 and 2020 - 2027. Similarly, it is expected that by 2020, further small hydroelectric power plants will be built constituting new obstacles to the longitudinal continuity, modification and regulation of flows as flood protection measures having an impact on biodiversity and increasing the risk of floods and damages below these modifications, etc.

Objective 4: Achieve the maximum sustainable yield in fisheries by 2015 and support achievement of good environmental status by 2020.

Status and prognosis: The target applies to marine fisheries (Directive 2008/56/EC - Marine Strategy Framework Directive) and therefore is irrelevant for Slovakia.

Objective 5: Identify invasive alien species and the routes along which they enter the EU, ensure the control and eradication of priority species, prevent their penetration and the domestification of new species by 2020.

Status and prognosis: Even though the presence of invasive plant species is continuously recorded, the assessment of routes and ways of invasive species spread has not been carried out yet and the planned inter-departmental committee for introduced species has not been established either. Fighting invasive plant and animal species in Slovakia is inadequate and quite non systemic. The control and enforcement of land owners' obligations with invasive species is inadequate. The deadlines of tasks set out in the Action Plan for the implementation of measures resulting from the updated National Biodiversity Conservation Strategy by 2020 have not been met yet. The planned legislative measures regulating these issues in compliance with international obligations are delayed as well. Due to this fact, the National Strategy for Invasive Species Management, the draft of which was prepared a few years ago, has not been updated yet and its wording will depend on provisions of the Act on Invasive Alien Species. Therefore, a further spread of invasive alien species and the endangering of original habitats and species including protected ones can be expected.

Objective 6: Increase EU contribution for preventing biodiversity loss on a global scale by 2020.

Status and prognosis: Slovakia acceded to all relevant international conventions focusing on biodiversity conservation and environment and landscape protection. In the near future, it will have to develop missing national strategies and implement proposed measures consistently in practice. The activity has to focus on meeting biodiversity targets (Aichi Biodiversity Convention) including the withdrawal of subsidies harmful to biodiversity and support of positive stimuli. Support efforts in fighting poaching and environmental crimes include international trading in endangered species and the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and focusing Slovak foreign aid to protect biodiversity in developing countries and countries with economies in transition. Consumption patterns have to be changed as well.

B. CLIMATE CHANGE

Objective 1: Greenhouse gas emissions

Status and prognosis: It is expected that in reality emissions will fall in relation to 2005 by 24 %. A maximum rise of 2.3 % was planned for 2013, in reality emissions fell by 19.5 %. In 2014 the greenhouse gas emissions from fossil fuels fell by 14.1 %. In 2015 the greenhouse gas emissions fell by 23.2 % against 2005. If there are no unexpected changes, this target will be achieved by 2020 with a great positive difference.

Objective 2: Increase the share of energy from renewable sources

Status and prognosis: The objective is to increase the share of energy from renewable sources in proportion to gross final energy consumption from 6.7 % in 2005 to 14 % in 2020. In 2012 generation from renewable sources reached 11.7 %, in 2013 it fell slightly to 11.2 % and in 2015 it rose to 12.9 %. An analysis of situations and trends indicates that the objective of 14 % from RES should be achieved, however, it will not be automatic and there are risks resulting from changes in the business environment.

Objective 3: Share of energy from renewable sources in all types of transport

Status and prognosis: The share of energy from renewable sources in all types of transport has a tendency to fluctuations. In 2011 its share was 5.5 %, in 2012 it dropped to 5.4 % and in 2013 it rose to 6.0 %. In 2015 there was a rise to 8.5 % in relation to 7.6 % in 2014. Achieving the 10 % target depends also on price trends and fuel availability and the ability to produce fuels of the so-called second generation and therefore whether it is achieved is uncertain.

Objective 4: Energy efficiency

Status and prognosis: Industrial efficiency is increasing and there is growth while energy consumption decreases. Flats, houses and public buildings are thermally insulated through various subsidy and commercial schemes. The objective of energy efficiency for primary and final energy consumption should be achieved.

Objective 5: Resource efficiency

Status and prognosis: Natural resource efficiency is increasing, an indicator of resource productivity is improving and at the same time there is a slight reduction of energy intensity. Material consumption is declining. The rate of municipal waste recycling is improving on average, however, Slovakia is far behind the EU average rate.

SUSTAINABLE GROWTH SCENARIOS 2020

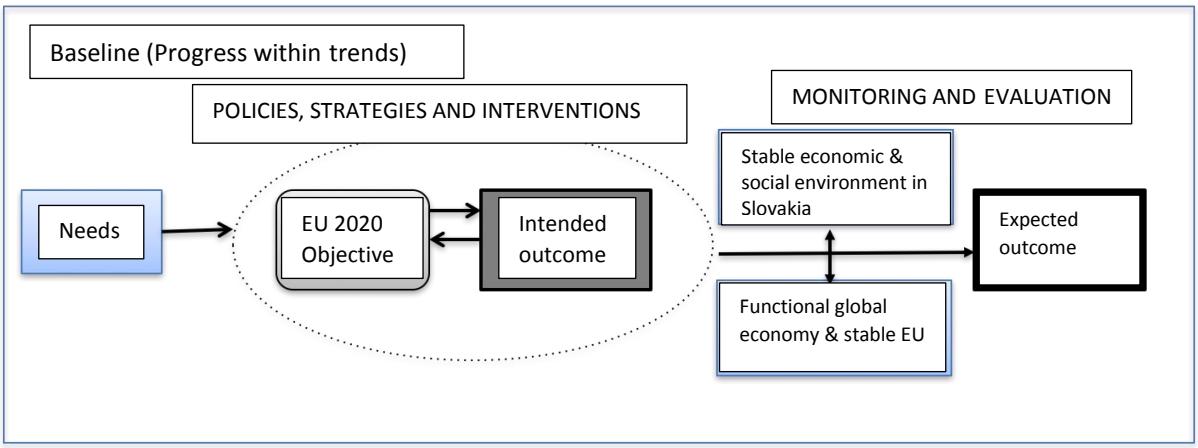
Analysis of scenarios is a process based on modelling and discussion. **An analysis of scenarios or projections of possible development cannot and may not show one accurate vision of the future.** Instead it presents **several alternative future trajectories.** As a consequence, the extent and impacts of possible future trends can be considered. Unlike forecasts, an analysis of scenarios is not based on extrapolation of past trends or passive past trends. It is not based on historical data and what it considers is not expected to really happen in the future. Instead, it tries to consider the possible development and reversals that may be associated with the past but which can also build on influences and events that are highly unlikely.

The first two parts of the report analyse Slovakia's objectives defined within the framework of the Europe 2020 Strategy and the EU Biodiversity Strategy by 2020 and related national objectives. A certain progress in biodiversity and climate change can be seen while some indicators are worsening. Due to technical reasons, this report cannot analyse Slovak trends in the context of the global goods exchange and relocation of production to low cost countries. Three possible scenarios of future development are called as follows:

- Scenario 1: **Baseline** (Progress within trends),
- Scenario 2: **Deregulation and post-policy** (Unsustainable short-term economic growth and intensification of social conflicts)
- Scenario 3: **Economic crisis** (Reduced production and consumption):

The three submitted scenarios are theoretical constructs. They are based on analysis, however, at the same time they offer critical combinations of environmental, social and economic factors and try to support discussion about the future. Each scenario combines more or less optimistic and pessimistic predictions for future development and deals with more but also less probable future trends. **The 2020 Scenarios should also represent a "stepping stone" for planned broader long-term scenarios that are currently under way.**

Scenario 1 - Baseline (Progress within trends)



OBJECTIVES	OUTLOOK 2020	
A: BIODIVERSITY		
A1: STOP DEGRADATION OF ALL SPECIES AND HABITATS	Negative tendencies will continue	←
A2: PRESERVATION AND STRENGTHENING OF ECOSYSTEM AND ECOSYSTEM SERVICES	Slight progress	→
A3: SUSTAINABLE AGRICULTURE AND FORESTRY	Stopping or slowing down the loss of biodiversity and slight improvement of environmental conditions	→
A4: SUSTAINABLE FISHERIES	–	–
A5: STOP INVASIVEALIEN SPECIES	Negative tendencies will continue	↓
A6. PREVENTING THE LOSS OF BIODIVERSITY ON A GLOBAL SCALE	Negative tendencies will continue	↓
B. CLIMATE CHANGE		
B.1: GREENHOUSE GAS EMISSIONS	Target values greatly exceeded	↑
B.2: INCREASE SHARE OF ENERGY FROM RENEWABLE SOURCES	Slow increase in compliance with objective	→
B.3: SHARE OF ENERGY FROM RENEWABLE SOURCES IN ALL TYPES OF TRANSPORT	Slow growth in compliance with objective but with environmental impacts	→
B.4 ENERGY EFFICIENCY	Slow reduction of consumption in compliance with objective	→
B.5 RESOURCE EFFICIENCY	Positive trends in all key indicators	↑

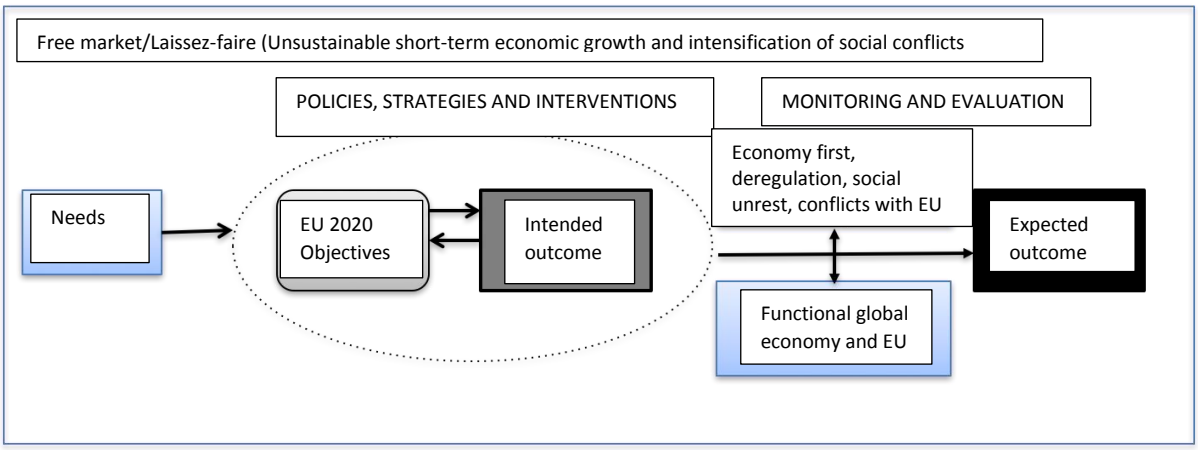
Explanatory notes: ↑ Objective will be greatly exceeded/Strong positive trends, → Objective will likely be achieved, ← Objective will not likely be achieved, ↓ Objective will not be achieved/Strong negative trends, ↔ Cannot be assessed.

Expected positive and negative factors and trends

Baseline (Progress within trends)	±	Stable economic and social environment
	±	Continuation of the current environmental policies and implementation of their instruments
	+	Greenhouse gas emissions will be reduced greatly above the planned level
	+	Reaching the target share of energy from renewable sources will not be easy but the target will be achieved
	+	Reaching the target share of biofuels will not be easy but the target will be achieved
	+	Reaching the targets of energy efficiency will not be easy but the target will be achieved
	+	Further improvement of indicators of resource efficiency
	–	Economic growth and increase in incomes will result in more pressure on production and consumption and this will be reflected in an increased use of natural resources, production of more waste (especially municipal) and a rise in waste management costs.
	+	Preserving social stability without a pronounced increase of households affected by energy poverty
	+	The stable absorption of European funds will continue and their impact on the fulfilment of objectives will be significant
	–	Economic growth and an increase in incomes will result in more pressure on tourism (investments and use of infrastructure) with negative impact on the country, environment and biodiversity protection.
	–	Increasing pressure from investors on ecosystems and climate change will result in the degradation of ecosystems and the loss of biodiversity along the ongoing illegal killing of protected species and trade in and to reduced ecosystem services.
	+	Ecological revitalization and creating blue and green infrastructure will help to improve biodiversity, ecological connectivity and spatial ecological stability of the territory.
	+	Implementation of agro-environmental measures will help to protect agroecosystems and species linked to the agricultural landscape, more efficient use of ES in agricultural land.
	–	The loss of primaeval and natural forests and species depending on them will reduce the amount of ES provided by natural forests and will have negative impacts on climate change.

Explanatory notes: +Positive factor, ± Ambiguous factor, –Negative factor

Scenario 2 – Deregulation and post-policy (Unsustainable short-term economic growth and intensification of social conflicts)



OBJECTIVES	OUTLOOK 2020	
A: BIODIVERSITY		
A1: STOP DEGRADATION OF ALL SPECIES AND HABITATS	Acceleration of negative trends	↓
A2: PRESERVATION AND STRENGTHENING OF ECOSYSTEM AND ECOSYSTEM SERVICES	Further degradation of ecosystems due to pressure from investors	↓
A3: SUSTAINABLE AGRICULTURE AND FORESTRY	Agriculture Forestry	→ ↓
A4: SUSTAINABLE FISHERIES	–	–
A5: STOP THE SPREAD OF INVASIVE ALIEN SPECIES	Acceleration of negative trends	→
A6. PREVENTING THE LOSS OF BIODIVERSITY ON A GLOBAL SCALE	Slovakia's standing worsened	↓
B. CLIMATE CHANGE		
B.1: GREENHOUSE GAS EMISSIONS	Target values greatly exceeded	↑
B.2: INCREASE SHARE OF ENERGY FROM RENEWABLE SOURCES	Slow growth in compliance with objective will meet short-term targets, however, it will threaten long-term targets	→
B.3: SHARE OF ENERGY FROM RENEWABLE SOURCES IN ALL TYPES OF TRANSPORT	Slow growth in compliance with objective, however, insufficient to meet the target	←
B.4 ENERGY EFFICIENCY	Slow reduction of consumption in compliance with objective, however, support slowed down.	←
B.5 RESOURCE EFFICIENCY	Combination of positive and negative trends	↔

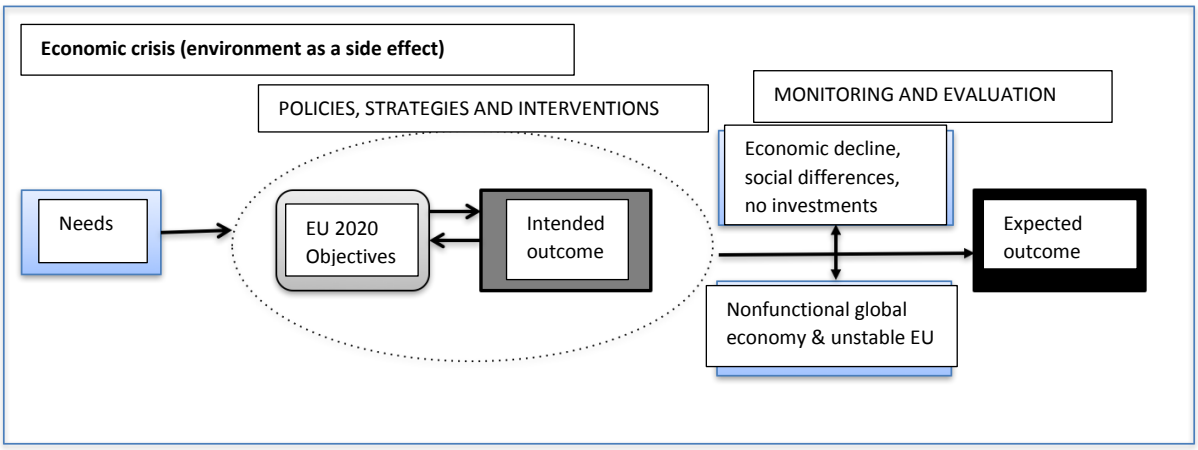
Explanatory notes: ↑ Objective will be greatly exceeded/Strong positive trends, → Objective will probably be achieved, ← Objective will not likely be achieved, ↓ Objective will not be achieved/Strong negative trends, ↔ Cannot be assessed.

Projected positive and negative factors and trends

Economic growth above all else (Unsustainable economic growth and intensification of conflicts)	±	Economic growth will be achieved in a short-term horizon, however, it will give rise to ecological, environmental and social externalities
	–	Weak or just formal support of environmental policies and implementation of their instruments will result in further deterioration of nature and the environment
	+	Greenhouse gas emissions will be reduced greatly above the planned level also due to a radical anti-subsidy funding policy
	–	The growth of the energy share from renewable sources will slow down due to reduced subsidies and lack of support of preferential purchase prices, however, it will finally be achieved
	–	The target share of biofuels will not be achieved due to reduced subsidies and insufficient support of second-generation biofuels
	+	Reaching energy efficiency targets will not be easy and the targets will not be achieved
	±	Indicators of resource efficiency in some industrial sectors will improve a little and others will benefit from reduced pressure on regulation and letting the "free" market decide
	–	Economic growth and an increase in incomes will result in more pressure on production and consumption and this will be reflected in increased use of natural resources, production of more waste (especially municipal) and a rise in waste management costs
	–	Pressure from investors in different areas will gradually increase resulting in a worsening status of natural ecosystems and threatened ecosystem services
	–	Lower social stability will result in an increase in households affected by energy poverty and increase in illegal logging and increased use of other natural resources (such as harvesting of non-wood forest products, poaching and similar)
	±	Improvement of agro-ecosystems quality due to the application of agro-environmental measures combined with a slower rate of EU fund absorption
	–	Support of economic utilization accelerating the loss of primaeval and natural forests and dependent species, decrease in the amount of ecosystem services provided by natural forests and the associated more significant impact of climate change
	+	The restoration and revitalization of natural ecosystems due to the creation of blue-green infrastructure
	–	Expected higher impact of stress factors on the ecosystem and ecosystem services due to intensive development of human activities
	–	Due to economic isolation, refraining from being an active member in the EU and international climate and biodiversity conventions and an escalation of tension between Slovakia and the EU will result in a weakened international position for Slovakia

Explanatory notes: +Positive factor, ± Ambiguous factor, –Negative factor

Scenario 3 - Economic crisis (Reduced production and consumption)



OBJECTIVES	OUTLOOK 2020	
A: BIODIVERSITY		
A1: STOP DEGRADATION OF ALL SPECIES AND HABITATS	Negative tendencies will continue	→
A2: PRESERVATION AND STRENGTHENING OF ECOSYSTEM AND ECOSYSTEM SERVICES	Improvement regarding ecosystem degradation	→
A3: SUSTAINABLE AGRICULTURE AND FORESTRY	Less economic activity, however, negative trends in utilization of forests and ecological agriculture production	↔
A4: SUSTAINABLE FISHERIES	–	–
A5: STOP THE SPREAD OF INVASIVE ALIEN SPECIES	Negative tendencies will continue	→
A6. PREVENTING THE LOSS OF BIODIVERSITY ON A GLOBAL SCALE	Political support but lack of direct activities	→
B. CLIMATE CHANGE		
B.1: GREENHOUSE GAS EMISSIONS	Target values greatly exceeded	↑
B.2: INCREASE SHARE OF ENERGY FROM RENEWABLE SOURCES	Slow increase in compliance with objective	→
B.3: SHARE OF ENERGY FROM RENEWABLE SOURCES IN ALL TYPES OF TRANSPORT	Slow increase in compliance with objective	→
B.4 ENERGY EFFICIENCY	Slow reduction of consumption in compliance with objective	↑
B.5 EFFECTIVE USE OF RESOURCES	Positive trend in all key indicators	↑

Explanatory notes: ↑ Objective will be greatly exceeded/Strong positive trends, → Objective will probably be achieved, ← Objective will not likely be achieved, ↓ Objective will not be achieved/Strong negative trends, ↔ Cannot be assessed.

Projected positive and negative factors and trends

Economic crisis (Environment as a side effect)	±	Strong economic decline will occur and will be accompanied by a decrease in incomes and increased pressure on production and consumption and it will be reflected in lower pressure on source consumption, less waste production (mainly municipal) and lower waste management costs
	+	Continuation of the current environmental policies, implementation of their instruments and support of cohesion policy projects
	+	Lower energy consumption, greenhouse gas emissions will be reduced greatly above the planned level
	±	The growth of energy shares from renewable resources will reach the planned values, however, long-term targets will be threatened due to the unstable business environment
	+	The share of biofuels will go up (due to lower overall fuel consumption) and the target will be achieved
	+	Reaching the targets of energy efficiency will not be easy but the targets will be achieved
	±	Improvement of resource efficiency indicators and simultaneous reduction in production and rise in unemployment
	–	Reduced social stability will result in the rise of households affected by energy poverty and pressure on natural resources and illegal logging
	–	A decrease in organic food production due to the lower purchasing power of people
	–	A drop in activities associated with the restoration and revitalization of ecosystems and creation of blue-green infrastructure
	±	More ecosystems and ecosystem services will be preserved due to the fall in investment
	–	Financial resources will be less predictable, sufficient, regular and targeted, insufficient funds will result in worse maintenance and preservation of ecosystems with eventual impact on ecosystem services
	–	Gradual loss of primaeval and natural forests and dependent species, reduction of ecosystem services provided by natural forests, climate change impacts
	+	Improvement in the quality of ecosystem ecological factors (lower impact of stress factors)

Explanatory notes: +Positive factor, ± Ambiguous factor, –Negative factor

CONCLUSION

Two basic forms of scenarios are used in forecasting: ***qualitative*** and ***quantitative***. Qualitative scenarios describe possible developments by using words or visual symbols and do not use numerical estimates. They can take the form of diagrams or sketches, but mostly consist of narrative texts so-called "storylines". Quantitative scenarios provide the necessary numerical information in table of graph form. The accuracy of numbers is sometimes perceived as a sign that we know more about the future than is actually possible and this is the main disadvantage of such a form. They are usually based on computer models working with much simpler facts and one explanatory framework in general. For the purpose of our scenarios, the quantitative form is used as a basis but we also use quantitative estimates wherever possible (in our case mainly the indicators for climate change trends).

Another way to classify scenarios is to differentiate between "exploratory" and "anticipatory" scenarios. Exploratory scenarios (knows also as "descriptive scenarios") are those that begin in the present and study future trends. On the contrary anticipatory scenarios (also known as "normative" scenarios) start with a prescribed vision of the future (either optimistic, pessimistic or neutral) and then work backwards in time to figure out how this future could emerge.

If Slovakia and key indicators are considered, two opposing trends can be seen. On one hand, there is a clear separation of economic growth from resource consumption, an increase in greenhouse gas emissions and a negative impact on biodiversity (a so-called decoupling). This is defined as the basis of green growth.

Positive trends in decoupling are confirmed by the energy, carbon and resource intensity of production. Resource productivity increased from 0.94 in 2010 to 1.11 EUR/kg in 2015. Energy intensity (in kgoe/EUR) oscillates around 0.33 and water consumption in the industrial sector and households is declining. On the other hand, despite the crucial importance of ecosystems and ecosystem services for the country, they are permanently being threatened and degraded. The loss of biodiversity and degradation of ecosystems and ecosystem services will most likely continue even if planned measures are implemented. The question is to what extent the negative trends in this area can be slowed down by 2020.

For the purpose of evaluation and the development of future scenarios, the report takes into consideration the existing target values by 2020 expressed either quantitatively (volume of CO_2 emissions or share of energy from renewable resources), or qualitatively (e.g. biodiversity status). This is the framework containing clear target values (as determined and approved in the Europe 2020 Strategy or the EU Biodiversity Strategy by 2020). The aim was not to standardize the steps to achieve determined values. In this respect the nature of scenarios is exploratory. **Their purpose is to provide a short-term exploratory vision by 2020 and simultaneously create the basic frame for the development of long-term scenarios by 2040 or eventually by 2050.**