THE EUROPEAN ENVIRONMENT
STATE AND OUTLOOK 2015

COUNTRIES AND REGIONS

European Environment Agency

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SOER 2015 country briefings provide an overview of state of the environment across 39 European countries. They are part of the EEA's report SOER 2015, addressing the state of, trends in and prospects for the environment in Europe. The EEA's task is to provide timely, targeted, relevant and reliable information on Europe's environment.

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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark
Tel.: + 45 33 36 71 00
Fax: + 45 33 36 71 99
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

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Albania

Main themes and sectors addressed in the national State of Environment

The State of Environment Report (SoER) is prepared every year by the National Environmental Agency (NEA) and is a legal obligation[1][2]. The environmental indicators used in the Report are based on the data provided mainly by the monitoring of environmental indicators and from information and data provided basically by NEA and other public research and monitoring institutions at the national level.

The SoER[3] shows the state of the main environmental indicators for air, water, biodiversity, soil, climate change, forests etc and is based mainly on the Driving Forces-Pressures-State-Impacts-Responses (DPSIR) framework. Indicators which can not be covered and monitored by the NEA are obtained from the following bodies:

- Various ministries;
- Other public institutions;
- Research and scientific institutes contracted by NEA.

The publication of environmental monitoring data aims to raise public awareness on the state of environment at local and national level. It offers reliable information concerning critical issues, risks, and pressures, which should be under continuous monitoring and supervision.

Key findings of the State of Environment report

The SoER provides information on the state of the main environmental indicators, their trend by giving recommendations and proposing the necessary legislative measures and acts needed to be drafted by policymakers.

The monitoring of urban air quality is focused on indicators for: PM10, PM2.5, O_3, NO_2, SO_2, CO and Benzene. Based on the data assessment from the period 2011 to 2013 in Tirana, a decrease of 20-30% has been observed at the concentration level of PM10 and PM2.5. This is due to improvements made in infrastructure and to several legislative measures undertaken regarding the standardization of used cars and vehicles. At the national level the concentration of CO and Benzene are at levels within the EU standards.

Groundwater monitoring is made on the main watershed basins for chemical parameters, NO_3, NO_2, NH_4, HCO_3, Cl, SO_4, Na, Ca, Mg,K, Fe, dissolved oxygen, conductivity and hazardous substances. The level of chemical parameters monitored are within the allowed limits. Groundwater in Albania are classified as freshwater and have neutral and weak alkalinity, and strong average hardness. Content is within the maximum allowed values.

The quality of bathing water is focused on the main beaches of Albania for the following microbiological indexes: Enteroccoccus Intestinalis (IE), Coliform faecalis probably Eschericia Coli including sanitary inspection. The classification is based on the WHO/UNEP-UE criteria**.** According to the assessment made nearly 60% of the coastal bathing water stations in 2013 were classified within the A and B categories (A being excellent quality and B good quality).

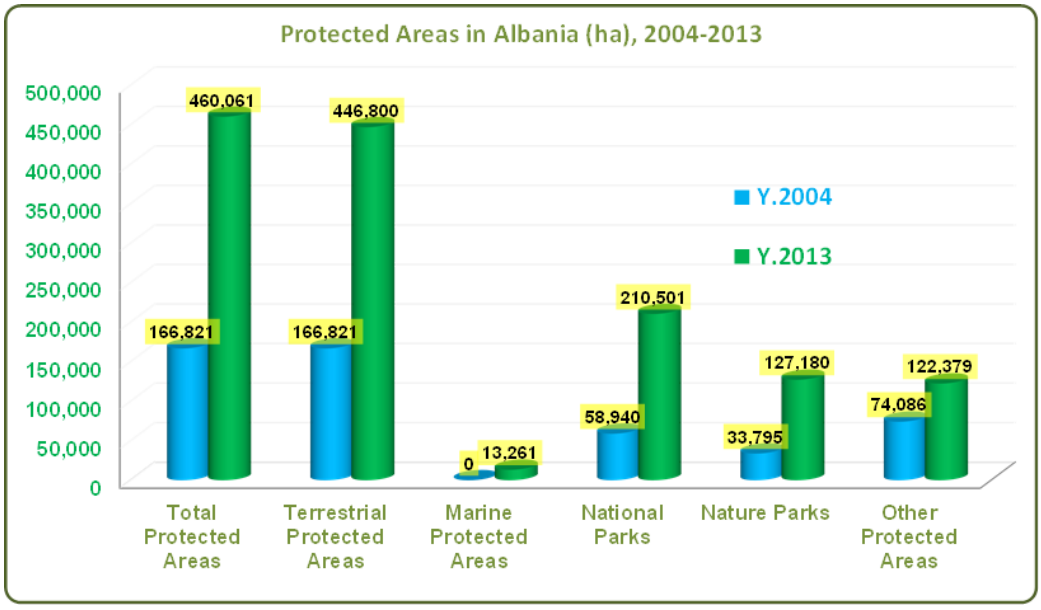
Protected Areas (PA) are classified according to the IUCN (International Union for the Conservation of Nature) categorization. The PAs have the greatest ecological, economic, cultural and natural heritage values of the country. Therefore their protection and preservation is of the uppermost importance.

One of the main priorities of the Government over recent years has been the designation of new PAs. This has also been articulated in the National Strategy on Biodiversity[4]. In 2004 the total PA surface area was nearly 9% of the entire country, while in 2013 it covered 16% (Figure 1 shows the PA trend in hectares). The designation of new PAs has influenced biodiversity conservation and protection within and around these areas which in general seems to be well protected. In spite of the positive influence of the new PAs on biodiversity, at present they still face various problems and challenges:

a) habitat degradation from coastal erosion;
b) illegal logging;
c) illegal fishing, poultry and wild animals hunting;
d) inefficient management of recreation activities.

These are critical issues where additional efforts should be addressed.

Figure 1. Trends in the increase of protected areas, 2004-2013

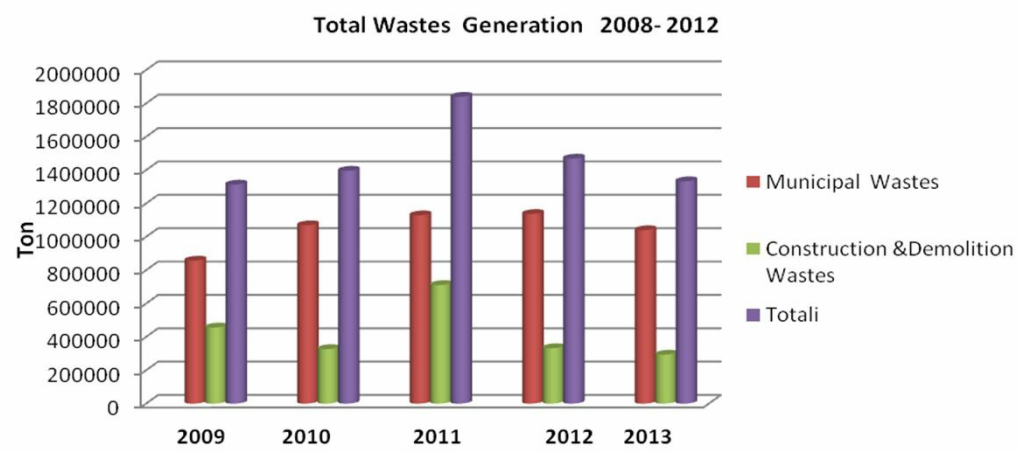


Continual monitoring of the state of forests[5] takes place and is based on the CORINE classification. Albania is considered a country with high diversity of habitats and forest species. 40 habitats are identified as rare and endangered with the number of endangered species approaching 320. During the last two decades the total forest area decreased by 1.4%. This is due to changing land use categories in forest areas. It is directly related to the transformation and modification of forest lands. These are the basic problems caused by illegal logging, demographic movements, increase in the demand for wood and energy, overuse of forests resources, etc.

Waste management in Albania is decentralized. The responsibility for waste management goes to local government units. The trend of waste generation in total municipal, construction and demolition waste from 2009 to 2011 shows an increase, whereas during 2012 there was a decrease compared to the previous year. Meanwhile a slight increase in municipal waste, and a decrease in construction demolition waste during 2012 in comparison with 2011, was observed (see Figure 2). The new National Plan on Waste Management 2010-2015[6] envisages the treatment and management of waste on a regional basis involving the development of new landfills complying with EU standards.

There is still much work to be done to comply with the standards and requirements of the EU Directives on Waste.

Figure 2. Total waste generation, 2008-2012



Main policy responses to key environmental challenges and concerns

> Albania is working towards European Union integration and the fulfilment of obligations stipulated by the MSA (Stabilisation Association Agreement). In this regard environmental legislation is one of the top priorities. Efforts are being focused on transposing of the EU *acquis* and Directives concerning Air Quality, Water, Nature Protection and Biodiversity, Wastes, Climate Change, Noise, Chemicals etc.

A new law on **environmental protection**[7] has been approved and entered into force in 2012. Its objective was to raise the level of environment protection by establishing a consolidated network of environmental institutions at national and regional level linked with environmental policy implementation.

During the period 2013 to 2014 the legislation concerning **the Rules and Procedures on Environmental Impact Assessment (EIA) and Environmental Permissions (EP)** together with the relevant regulatory package have been drafted and approved[8].

One of the priorities of the Albanian government **has been to complete the legislation on Air Quality (AQ) in fully accordance with the EU Directive 2008/ 50/EC**. The relevant national law was duly amended.

Progress was made in terms of drafting the legislation regarding the energy efficiency and renewable energy, based on the EU Directives 2001/77, 2003/54/EC, and 2003/55/EC. Accordingly the National Strategy for Energy (2007-2020)[9] was updated.

A new 'Environmental Intersectorial Strategy (2013- 2020)[10]' was recently drafted. The principal objective being sustainable development and protection of natural resources.

Attention is being paid to the completion of the legislation on the waste management in Albania in accordance with the EU Directive on waste 2008/98/EC . The 'National Strategy and Action Plan for the Waste Management[11]' and the law on 'Integrated Management of wastes in Albania[12]' entered into force in 2012. Five regional action plans for waste management for the following regions: Tirana, Elbasan, Durres, Vlora, and Korca were approved.

Country specific issues

The SoER address the main environmental issues and challenges according to the priorities established by the government.

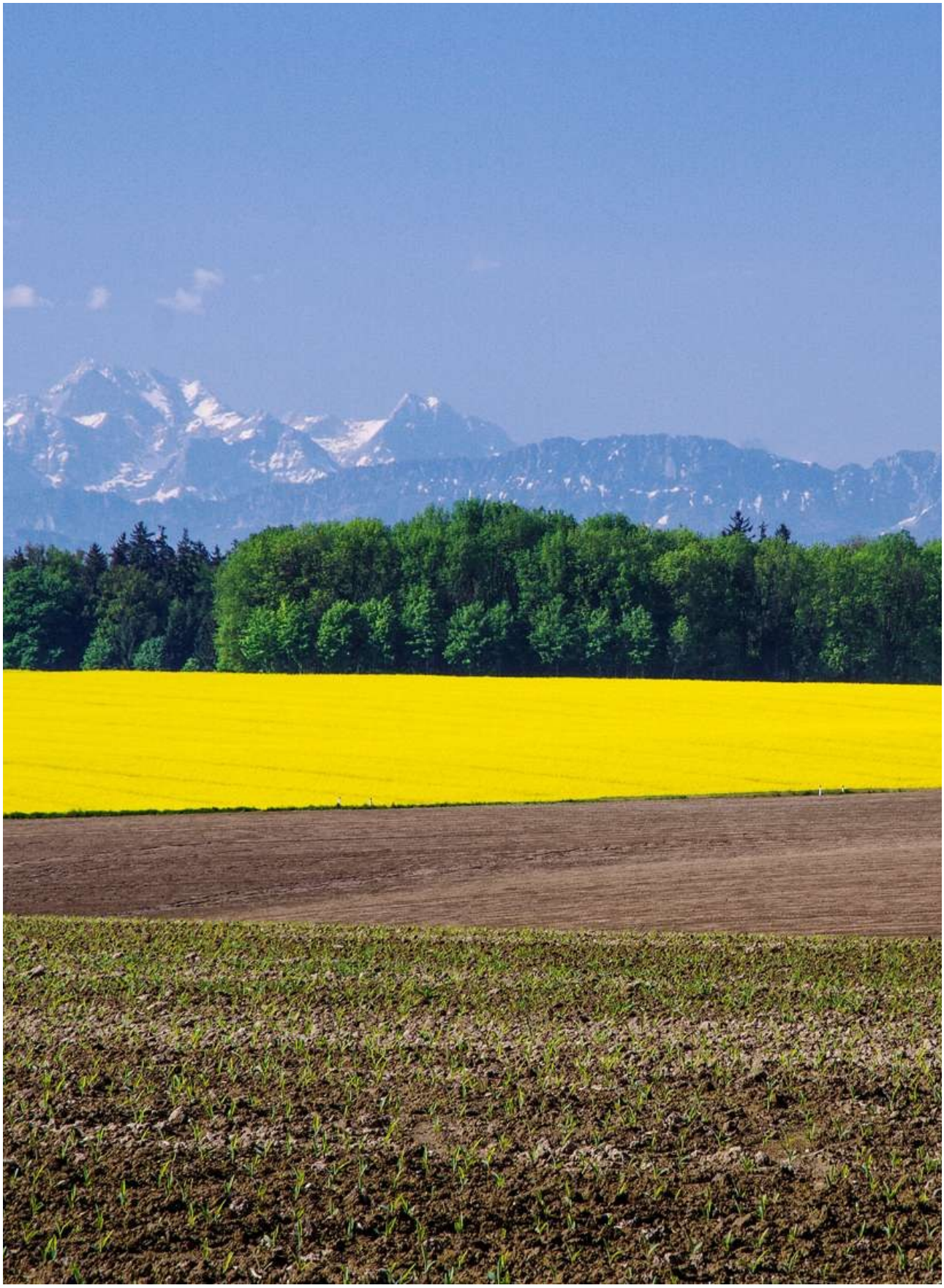
The 'Environmental Intersectorial Strategy 2013-2020[10]' is draft ended and is ready to be approved by the government.

With reference to climate change mitigation, and the Second National Communication (SNC) for Albania, was highlighted that by 2025, the emission reduction by abatement scenario shall reach 48%. Mitigation measures proposed in SND includes all the main sectors such as industry, energy, services, transport, agricultural etc.

There has been an improvement in the quality of coastal bathing waters during recent years. This is due to investments made in the waste water treatment infrastructure. Until a few years ago the main source of pollution for coastal bathing waters has been the discharges of untreated waste water. However, investments made in some of the main cities have changed significantly the quality of bathing water.

One success story worth highlighting is the completion of a national legal framework on the integrated management of waste in accordance with the EU Directive on waste. Much work is needed to fully implement this. In addition, raising public awareness and subsequent engagement in related issues is also necessary as are more investments in building other landfills according to EU standards.

> **In general Albania has demonstrated progress on environmental issues**, regarding the management of environmental problems but still too many efforts are needed especially for the implementation of the environmental legislation.



Countries and regions

Austria

Main themes and sectors addressed in the national State of Environment report

The State of the Environment Report (SoER) describes the environmental situation in Austria. It is a written report on the performance of tasks specified in the Environmental Control Act[1], and is presented to the Austrian National Assembly by the Federal Environment Minister every three years. The Umweltbundesamt - Austria's environmental protection agency - is responsible for preparing the SoER.

> The 18 chapters of the 10th SoER[2] address the following environmental themes: Water and Water Management, Air, Soil, Climate change mitigation, Climate change adaptation, Agriculture and Forests, Biodiversity and Nature protection, Noise, Resource and Waste Management, Contaminated Sites, Chemicals, Energy, Industry, Transport, Tourism, Spatial Development, Environment and Health, and Sustainable Development.

To ensure continuity and comparability, and to better reach the interested audience, all chapters within the SoER are structured as follows:

- Environmental Policy Targets
- Situation and Trends
- Summary Assessment and Outlook
- Recommendations

Any feedback and comments on the contents and/or technical handling of the report can be sent by e-mail to: ukb@umweltbundesamt.at.

For the latest data, facts and figures, please go to **www.umweltbundesamt.at**.

Key findings of the State of Environment report

The 10th Austrian SoER confirms that the quality of **water resources** in Austria is generally good[3]. This applies to groundwater and surface waters and also to bathing waters. The Austrian National Water Management Plan[4] states that there are deficiencies in flow conditions, water structures and in the continuity of Austrian rivers. In the field of wastewater treatment, more attention will have to be paid to the maintenance of existing infrastructures, particularly the sewage systems[5].

In recent years, **air quality** in Austria has improved considerably and **emissions of most air pollutants** have decreased. Emission ceilings for 2010 were complied with for sulphur dioxide, ammonia and volatile organic compounds. However, emissions of nitrogen oxides are still clearly above the emission ceilings, despite a downward trend in recent years. The yearly average limit value for nitrogen dioxide has being exceeded at several monitoring stations adjacent to places where traffic is the most significant source.

The admissible levels for particulate matter which are specified in the European Air Quality Directive[6] were exceeded

in some federal provinces in 2010 and 2011, also due to unfavourable meteorological and dispersion conditions. In 2012 and 2013 the situation improved.

Austria has achieved its **climate change** mitigation target under the Kyoto Protocol**.** The share of renewable energy in gross final energy consumption has been rising continuously and amounted to as much as 32.2 % in 2012[7].

The total amount of **waste** generated in Austria has slightly decreased compared to previous years, but further action is needed to reduce the amount of waste from households and to prevent food waste.

To achieve the policy targets stipulated for **contaminated site management,** it will be necessary to revise the legislative background and to speed up further the identification and remediation of contaminated sites.

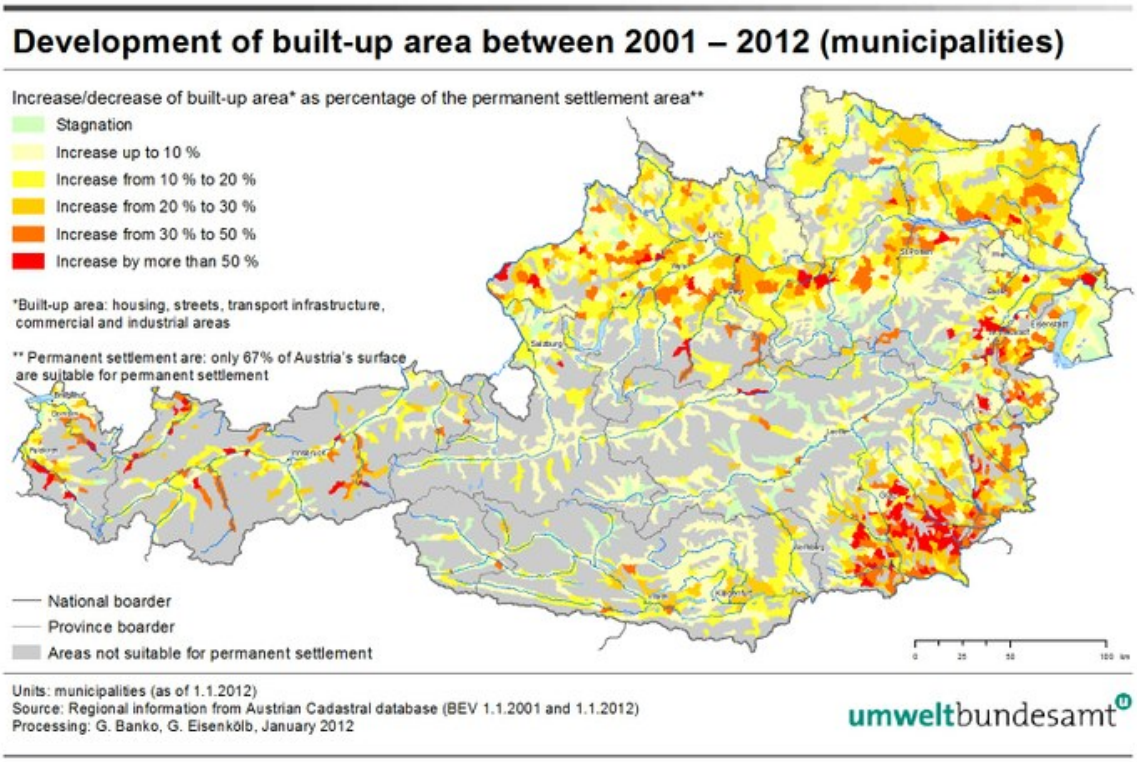
All six Austrian **National Parks** are recognised by the International Union for Conservation of Nature (IUCN)[8]. About 2,8 % of the national territory has been classified as National Park, altogether about 16 % of the national territory has been classified as nature reserve. Despite the large number of measures, many **habitats and species** are under pressure from land use by humans and habitat changes, which will be exacerbated even further by climate change.

Agricultural areas in Austria are still free from genetically modified organisms. In 2010, more than 19 % of agricultural land was farmed organically – one of the largest shares of organic agricultural land in Europe.

While the expansion of mixed **forests** (and reduction of coniferous monocultures) is an encouraging step towards more natural forest development, and the increasing use of wood as a source of renewable energy plays an important role in climate change mitigation, biodiversity conservation and restoration efforts still need to be increased in the Austrian forests.

There is an increasing loss of **soil and unsealed area** to development in Austria. In total, the amount of land being used for development (construction land and traffic areas, sports facilities, other infrastructure areas) has remained high at 22.4 hectares per day. Of these, 4.3 hectares are sealed every day, that means covering of the ground by an impermeable material such as asphalt. There is still great potential for the reuse of brownfields.

Figure 1: Development of built-up area between 2001-2012 in Austrian municipalities



Source: Umweltbundesamt (2013): 10. Umweltkontrollbericht – Umweltsituation in Österreich (10th State of the Environment Report - Environmental Situation in Austria)

Main policy responses to key environmental challenges and concerns

Nitrate inputs to **groundwater** are addressed, inter alia, through measures implemented in the framework of the Austrian agri-environmental programme[9].

Austria's implementation of the EU **Floods** Directive[10] is a continuation of national policies promoting integrated flood risk management, based on recent experience from devastating floods.

Regarding **air pollution** an amendment to the Austrian Ambient Air Quality Act[11] and stricter regulations in the transport sector[12] have further improved conditions in designated areas.

In the area of **climate change mitigation** domestic measures under the national climate strategy[13] showed considerable GHG reduction effects since 2005. However, flexible Kyoto mechanisms also played an important role for Austria's compliance under the EU burden sharing target of -13 % in the first commitment period. The Austrian Climate Change Act[14] includes sectoral emission ceilings for the years 2013 up to 2020 and ensures a more coordinated and stringent implementation of mitigation measures. Austria has implemented the "klima:aktiv" programme[15] , which supports among others measures in the area of mobility.

A national strategy on **climate change adaptation**[16] was developed and finalised in 2012 with broad-based stakeholder engagement.

A new national **biodiversity** strategy[17] that complies with EU requirements is being developed to safeguard domestic species diversity in a sustainable way. To further strengthen and consolidate cooperation among all stakeholders, the Austrian National Park strategy[18] was adopted in 2011, including a far-reaching public awareness campaign ("National Parks Austria[19]"). A variety of measures are implemented in the framework of the so-called "to live diversity" campaign[20].

In **spatial development,** measures regulating the allocation of land for building purposes are in place in nearly all of the federal provinces (use of designated, undeveloped building land). In some of the federal provinces, the designation of floodplains and retention areas has already been incorporated into spatial planning regulations.

Country specific issues

Use of renewable energies: For further upgrades of hydropower, a criteria catalogue has been developed[21] to achieve a balance between conservation efforts and an efficient use of water resources. The Green Electricity Act 2012[22] defines quantitative targets for upgrades of hydropower, wind energy, biomass, biogas and solar energy during the 2010 – 2020 period.

Resource and waste management: The Austrian Resource Efficiency Action Plan (REAP)[23] provides a framework for Austrian efforts towards increasing resource efficiency (by at least 50% by 2020), identifies relevant action fields and suggests policy instruments and measures for specific implementation.

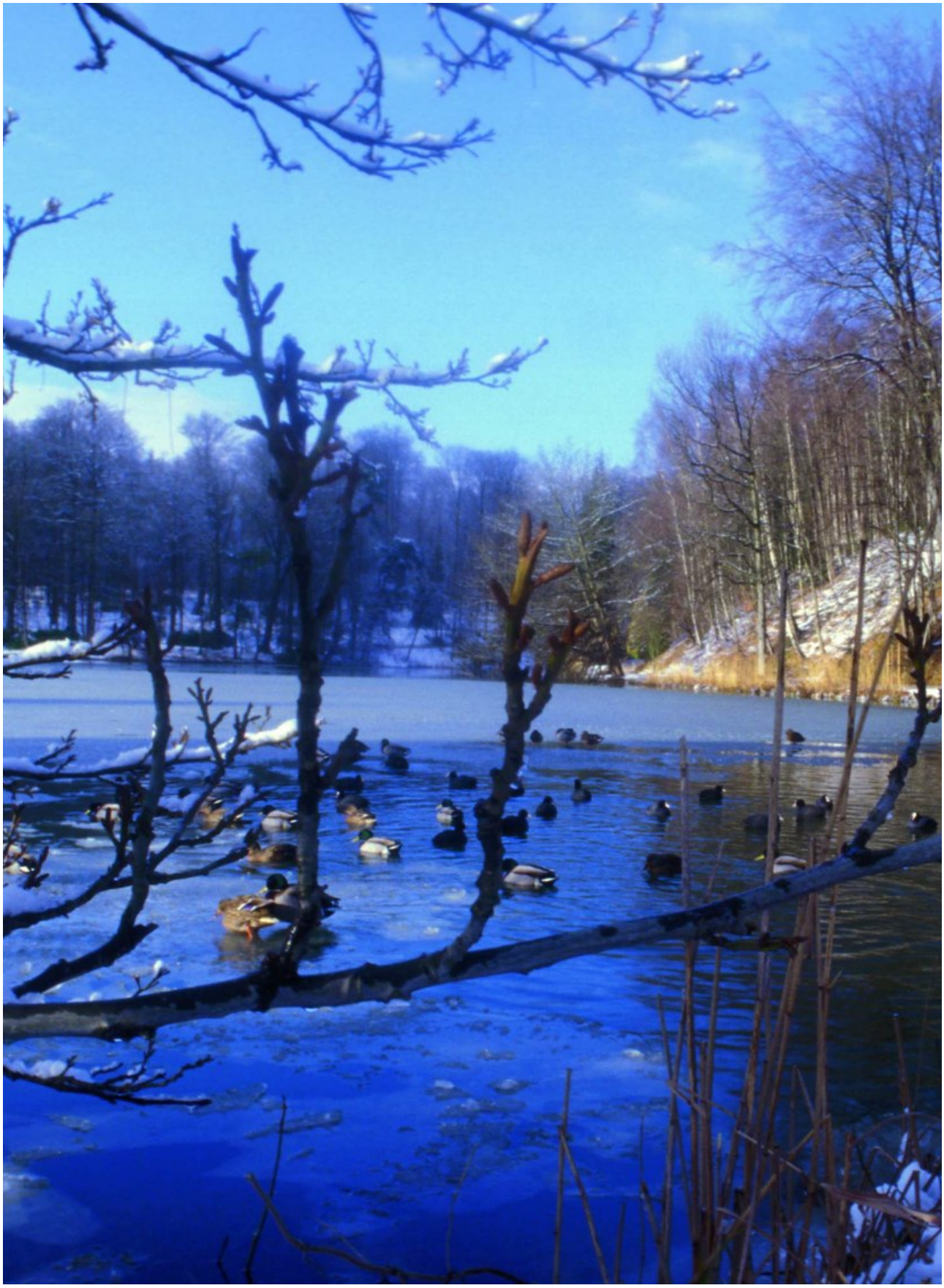
Biodiversity and nature protection: The Austrian National Park Strategy[18] specifies goals and success indicators for National Parks and their further development until 2015 and sets out a vision for 2035. Monitoring projects for invasive neobiota are being implemented on the local and the regional level.

Noise: Since 2012 noise maps have been available for 5 agglomerations, as well as for all airports, for more than 5 000 km of the main roads and for 2 000 km of the main railroads[24]. They provide a basis for planning instruments in regional planning.

Transport: The Austrian General Transport Plan[25] defines quantitative environmental goals as part of a transport strategy (e.g. reducing the contribution of transport to ambient air pollution by 2025 by up to 70 % for NO_x and by 50 % for particulate matter ($PM_{2,5}$)). This is a significant contribution to the integration of environmental aspects in transport planning.

Tourism: The number of tourist businesses certified with the Austrian Ecolabel has increased since 2009. Especially the creation of the "Green Meetings and Green Events" ecolabel has proved to be a positive development[26].

Sustainable development: "Growth in Transition" is an Austrian project which intends to initiate a dialogue among institutions and people about how we can shape a transformation process which encourages a better balance between economic growth and sustainability[27].



Countries and regions

Belgium

Main themes and sectors addressed in the national State of Environment report

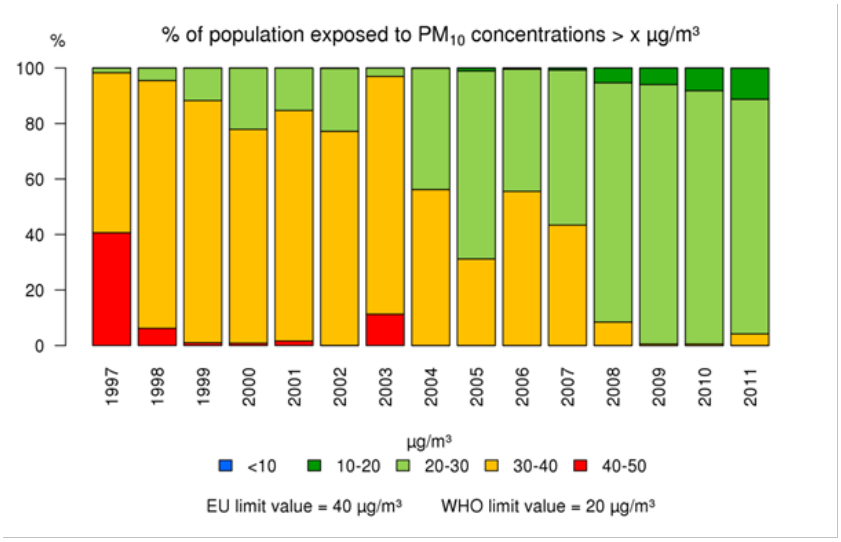
Due to the Belgian constitutional setup, environmental competences are mainly dealt with at the regional level, with the federal level taking care of various specific issues such as marine. All main areas/sectors/themes are addressed in the State of the Environment (SOE) reports elaborated independently by the different actors (three regions and at the federal level) based on their respective legal basis. For some themes, such as air or climate, collaboration takes place between the actors resulting in integrated Belgian reports.

Key findings of the State of Environment report

The Belgian annual air quality[1] report indicates significant improvement over recent decades, but also shows that a high percentage of the Belgian population is still exposed to excessive concentrations of the four most important air pollutants (PM, NO_2, O_3 and SO_2).

The downward overall trend of the minimum, average and maximum levels of nearly all indicators continued in 2011 though a number of indicators show a stagnating trend. However, Belgium still exceeds the European limits or target values for the number of exceedances of the PM_{10} daily limit value, the number of days with maximum 8-hour mean ozone concentration > 120 µg/m³ (and the accumulated excess or AOT60), the ozone AOT40 for forests, and the annual mean NO_2 concentration. Comparing the values with the more stringent and health-related WHO guideline values, indicate that almost all pollutants (and associated indicators) are still in exceedance (see Fig. 1).

Figure 1: Exposure of the population to annual mean PM_{10} concentrations, 1997-2011



Source: IRCEL-CELINE: Annual report Air Quality in Belgium 2011 [1]

In the **Brussels Capital Region**[2] energy consumption decreased by 18% between 2004 and 2011 despite population growth (12%). Major efforts in terms of urban wastewater treatment and the implementation of a "blue network" programme improved the quality of surface water.

In spite of the urban character of the region (7 155 inh./km^2), **nature** is well represented, with 54% of the area covered in green spaces and 14% benefiting from the Natura2000 status. Problems have nevertheless been observed: a shortage of green spaces in dense urban areas, connectivity and quality of the natural habitats often insufficient, regional forest management needs to adapt in particular to deal with climate change, rarity of open habitats. Other classical environmental challenges may also be quoted: soil contamination, noise pollution, waste production and recycling, **indoor and outdoor air quality**.

In **Flanders**[3] structural changes and improved **energy** efficiency delivered a significant reduction in the energy intensity of Flanders between 2003 and 2009. The economic crisis of 2008-2009 slowed this trend but due to a mild winter and lower non-nuclear power production, 2011 again saw a generally downward trend. Nevertheless, the gross domestic energy consumption (GDEC) in 2011 was still 1% above the level for 2000.

The pollutant load of domestic origin in Flemish **surface water** decreased further in the period 2000-2011 because of the systematic expansion and improvement of the public wastewater treatment network. The load on the surface water from companies fell noticeably but there has been no further reduction in recent years. The nitrogen and phosphorus losses from agriculture were lower in 2011 than in the early 2000s, but the reduction is less pronounced than for households and companies.

Since the 1990s, **atmospheric emissions** of various pollutants have decreased significantly in **Wallonia**[4] leading to an overall improvement in air quality, even if pollution peaks are still observed occasionally. This decrease is mainly due to a reduction in energy requirement and the growth of renewable sources (fivefold between 1990 and 2010). It allows Wallonia to broadly meet the targets set by European legislation and various international protocols. As water quality is concerned, it is estimated that 49% of surface water bodies and 30% of groundwater bodies in Wallonia will not achieve good status by 2015, despite major efforts. Additional measures must be implemented in the next River Basin Management Plan in order to promote further improvements.

Some 70% of agricultural land is showing signs of deficiencies in organic matter, having some consequences on **soil's** resistance to erosion. Soil pollution from local sources (2-10 potentially contaminated sites/10 km^2), mainly associated with Wallonia's industrial past, has received focus.

At the **Federal**[5] level, a recent report described the environmental impact of federal administrations activities (2009-2012). Results included: development of indicators to monitor **Marine** Strategy Framework Directive; achievement of the European target of 130g CO_2/km **emissions** for new cars, but still with a big share of diesel engines, contributing to the degradation of air quality; actions to increase sustainability visible through **EMAS** compliance, green public purchases, ISO 14001 compliance; increase of environmental market surveillance especially through a better knowledge of the **products** and quantity sold.

Main policy responses to key environmental challenges and concerns

Besides traditional environmental challenges, the **Brussels-Capital Region** also looks at specific urban issues such as indoor air quality, sustainability of housing/buildings/neighbourhoods, improved quantitative and qualitative offer of green and blue spaces. The various policies work through:

- environmental planning[6]: nature, noise, waste, water/flood risk, air-climate-energy, pollution peaks, energy efficiency, mobility, but also horizontal planning such as the regional sustainable development plan[7];
- regulations and control: including contaminated soil, electromagnetic waves, energy efficiency in buildings[8];
- economic incentives: including premiums and subsidies linked to energy savings and management of contaminated soil for individuals and professionals[9];
- information, awareness-raising, support, participation tools.

Flanders is facing major societal challenges: climate change, limited availability of space, biodiversity loss and scarcity of fossil fuels and raw materials. Policy initiatives include Flanders in action,[10] Pact 2020,[11] Flemish Strategy for Sustainable Development[12]. They state that transition towards sustainability is needed to tackle these challenges.

An environmental policy plan is drawn up every five years based on the environment and nature reports. Flanders aims to belong to the top five European regions when it comes to sustainable materials management. To achieve this, the Flanders' Materials Programme[13] was launched in 2012. Government, industry, centers of expertise and civil society are joining forces.

Wallonia works on the transition towards a low carbon in 2050 and a more efficient use of resources. The region relies on various drivers:

- Marshall Plan 2.green[14] followed by the Marshall Plan 4.0: priority action plans including new policy orientations integrating sustainable development, circular economy and energy transition;
- environmental planning (Waste prevention and Waste management plan for 2020[15]; Walloon Plan for Sustainable use of energy (2003, 2009)[16]; Climate Decree[17]; Plan for a Sustainable Management of Walloon Forests; River Basin Management Plans[18]; Walloon Pesticide Reduction Programme[19]; Sustainable Management Programme for Nitrogen in Agriculture[20];
- regulatory instruments and control (Decree of 05/06/2008 on punishing breaches of environmental legislation);
- economic support for voluntary approaches (agri-environmental measures, river contracts, branch agreements) or obligatory (waste reduction, container parks, Natura 2000 subsidisation);
- Information and awareness-raising tools: Centres Régionaux d'Initiation à l'Environnement (CRIE).

The **Federal** policy response implies intense collaboration with actors and stakeholders to insure coherence, complementarity and mainstreaming. Public services have a role to play in organising markets for products and services in line with environment protection and in reforming taxation and harmful subsidies.

Resource efficiency, air quality, environment and health assessment and management of new technologies, climate change, economic valuation of biodiversity and ecosystem services, responsible management of the North sea, further enforcement of legislation, will be addressed as part of a long term, resource efficient and low carbon transition. The following are being prepared:

- implementation the 2020 climate change and energy package;
- a national low carbon development strategy;
- a federal adaptation plan;
- the third federal plan on sustainable development.

Country specific issues

Faced with a high unemployment rate and demographic growth, the **Brussels urban project** includes a job-creation policy linked to the environment, based on the mobilisation of public and private players and associations around planned actions:

- Employment-Environment Alliance[21]: pursues objectives to stimulate sectors, research, innovation and economic transition.
- Brussels Sustainable Economy[22]: development of six economic sectors linked to the environment, within a priority intervention area.

Innovative and proactive policies are also being conducted in other domains such as management of contaminated soil and electromagnetic waves, or improvement in energy and environmental performance in buildings. Based on the tax revenues for the period 1995 to 2010, **Flanders** shows signs of a **'de-greening' of the tax system**[23]. The share of environmentally related taxes in GDP fell from 2.4% in 1995 to 2.0% in 2010. In 2005 their share peaked with 2.5%. The share of labour taxes in GDP fell slightly from 24.3% in 1995 to 24.0% in 2010. Compared with the EU-27, Flanders has high labour taxes and low environmentally related taxes.

The environmental **performance** of the new **Flemish vehicle fleet**[24] improved during the period 2008-2012. In 2011, encouraged by federal incentives, the 2015 target for CO_2 emissions from new passenger cars was already achieved. However, the subsidies also encourage the purchase of diesel vehicles. In March 2012, Flanders took a first step by reforming the traffic registration tax taking into account the emissions of both CO_2 and other pollutants.

Wallonia faces major energy and environmental challenges. Some policies to highlight:

- The **Marshall Plan 4.0**[25] refocuses the priorities of this economic restructuring program initiated ten years ago around the digital economy and circular economy (ecological transition of the economy by reducing consumption and use of raw materials as well as through recycling and waste recovery);
- the Decree for the **Walloon strategy of sustainable development**[26] adopted in June 2013 defines the long-term strategic vision for sustainable development. Three key issues are identified: energetic transition, restoration and protection of biodiversity, climate change. Action plans focus on sectorial objectives as production and consumption patterns, food, health and two transversal themes: energy and mobility;
- the **Regional Spatial Development Perspective (RSDP)**[27] proposes a vision for 2040 for the Walloon territory to address demographic, social, economic, energy and climate challenges.

The **Federal** environment reports[28] addressed four main policies: impacts of climate change, products and substances standards, the protection of biodiversity (North Sea) and efficient use of resources. Tax leverage and product standards were identified as crucial instruments. The 2013 indicator report showed progress since the first report but also highlighted the need for better cooperation between institutions. The Belgian government also adopted in 2013 the federal long-term strategic vision for sustainable development[29] to guide the transition of society and is preparing for the development of a Low Carbon Development Strategy.

Countries and regions

Bosnia and Herzegovina

Main themes and sectors addressed in the national State of Environment report

The Bosnia and Herzegovina (BiH) Constitution states that jurisdiction in environmental issues is split between entities (Federation of Bosnia and Herzegovina - FBiH and Republika Srpska - RS), the district of Brčko (BD), and at the cantonal/municipal level. The only institution at the state level with jurisdiction in environmental issues is the Ministry of Foreign Trade and Economic Relations (MoFTER).

Almost all environmental legislation operate at entity and BD level. All international agreements and projects are coordinated through the MoFTER.

Laws on environmental protection in the FBiH, the RS and the BD, as well as laws on water, are the founding legal acts that define and set out goals, principles, measures, responsibilities, documents, financing and supervision of environmental protection in BiH.

The 2012 State of the Environment Report (SOER) of BiH[1] is the first one of its kind within the country. It is viewed as one of the founding documents on environmental protection in BiH.

Due to the lack of state level legislation governing environmental protection and thus providing a basis for the development of such a report, the 2012 SOER was made under the framework of the UN Joint Program "Mainstreaming environmental governance: linking local and national action in BiH".

The SOER represents a comprehensive overview of the state of the environment and trends, pressures and their effect on the environment, for the following topics:

- Forest resources;
- Land and Soil Resources;
- Surface and Groundwater Resources;
- Biological and Landscape Diversity;
- Air Pollution and Ozone Depletion; and
- Climate change.

Key findings of the State of Environment report

Forest cover is extended to 50% of the total territory of BiH. Landmines are a potential threat to forests, causing certain areas to become unavailable for treatment and recovery efforts which aim to preserve the health of trees (e.g. protection from the bark beetle). Even though there are no data on illegal logging, there is a need to monitor the state and implementation of activities with the aim to prevent them.

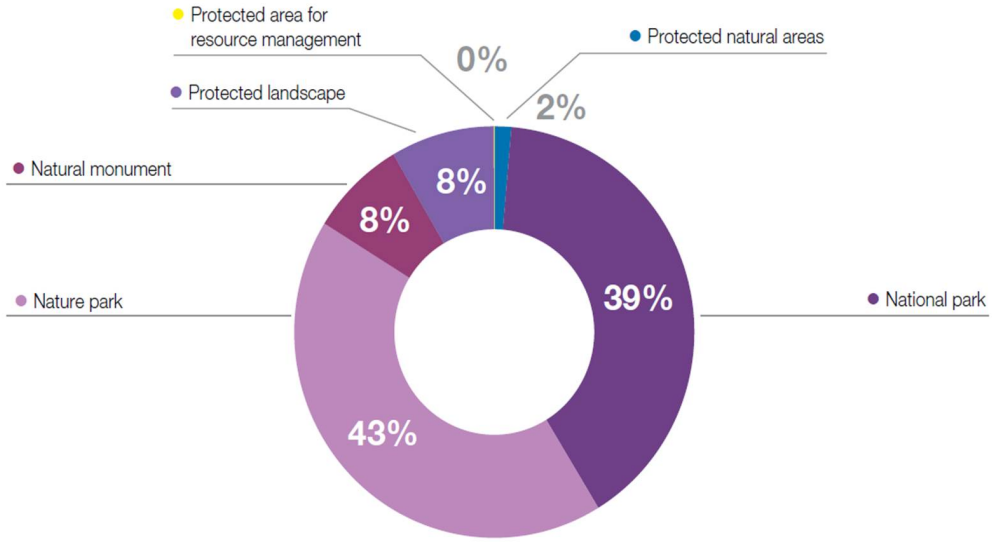
Land and soil resources are also among the most significant natural resources in BiH, the primary function of which is the production of food and raw materials. BiH covers an area of 5 112 879 hectares and close to 52% (2 600 000 ha) of the total land area is suitable for agriculture. The remainder is considered forestland.

The division of agricultural land per capita is 0.56 ha in the FBiH and 0.90 ha in the RS. When fertile land is considered, the state in the FBiH declines further, to 0.23 ha per capita, which is half the size compared to the RS (0.46 ha).

Wastewater treatment. In BiH, there is a clear problem of inadequate waste water discharge. Only some municipalities in the Federation and two in the RS have functioning facilities for sewage water treatment. In 2009, a positive trend of increasing treatment quality continued, as evidenced by an increase in the share of biological treatment methods. Meanwhile, in 2010 there was a slight decrease.

Biodiversity and protected areas. The richness of the living world in BiH is a result of spatial and ecological heterogeneity, geomorphologic and hydrological diversity, a specific geological past and climate diversity. The living world of BiH is characterized by a high degree of endemic and relic forms of living organisms. More than 5 000 species and sub-species of vascular plants, more than 100 species of fish, over 320 species of birds and other components of biological diversity have been identified in BiH. Different categories of protected areas in BiH are presented in Figure 1 below.

Figure 1: Categories of protected areas



Source: State of the Environment Report 2012 in Bosnia and Herzegovina

Air quality. Air quality in urban areas deteriorate during the winter period, due to emissions from stationary sources (small furnaces) and mobile sources (transport), combined with the location of cities in the valleys. Concentrations of SO_2 and PM_{10} exceed limit values in winter period, accompanied with heavy smog.

Greenhouse gas (GHG) emissions. Due to relatively low total energy generation and consumption, as well as low energy generation and consumption per capita, BiH remains a small emitter of GHGs with a total of 24.14 Mt CO_2 equivalents in 2005. Taking into account emission and estimated population size of 3.85 million, as well as calculation of GAINS model (Greenhouse Gas-Air pollution Interactions and Synergies), emission per capita in BiH for 2005 was 6.36 tons of CO_2 equivalent (UN Economic Commission for Europe, 2011).

Main policy responses to key environmental challenges and concerns

Besides the legislation, enforcement regulations, rules and procedures, and international documents, a large number of strategic documents were adopted during the period 2000–2012, which present the basis of continuous BiH efforts to implement reforms in the environment sector:

- the Solid Waste Management Strategy (2002);
- the BiH National Environmental Action Plan – NEAP BiH (2003);
- the UNECE EPR1 – First Environmental Performance Review (2004);
- the First National Report on the Implementation of UN Convention to Combat Desertification/ Land Degradation in BiH (2007)[2];
- the Initial National Communication to the UN Framework Convention on Climate Change (2009)[3];
- I, II, III and IV[4] BiH report to UN Convention on Biological Diversity (2005-2010);
- the Biological Diversity Strategy with Action Plan (2010);
- the UNECE EPR2 – Second Environmental Performance Review (2011)[5];
- the NCSA Report (National Capacity Self-Assessment, 2012);
- the Study on Energy Sector in BiH (2008)[6];
- "BiH in the Process Rio + 20" - BiH report for the UN Convention on Sustainable Development (UNSDC) which was held in Rio de Janeiro on 20-22 June, 2012; and
- the Second National Communication to the UNFCCC (2012)[7].

Some important documents still need to be adopted, such as:

- Water Policy in BiH;
- National Biodiversity Strategy and Action Plan; and
- enacting more legislation to be harmonized with the EU *acquis*.

Country specific issues

Environmental governance in BiH focuses on institutions at four administrative levels: state, entity, cantonal and municipal. According to the Constitution, environmental policies and natural resource use are the responsibility of entity and BD governments which regulate environmental matters through laws, regulations and standards.

However, when the Law on Ministries and Other Bodies of Administration of BiH was adopted in March 2003, the MoFTER was given the power to define policies and basic principles, coordinate activities and harmonize plans of the entity bodies, government and institutions. This is in accordance with international obligations in the areas of agriculture, energy, environmental protection, development and use of natural resources and tourism.

Even though such a complex administrative structure suffers from a lack of vertical (entity/canton/municipality) and horizontal (inter-entity/inter-ministerial/inter-municipality) cooperation, a shift forward in the environment sector reform implementation is evident.

> The BiH accession process to the EU is one of the main driving forces in the environment sector reform, which, for the most part, applies to the harmonization of domestic legislation with the *acquis communautaire*.

In the period 2002 to 2004, the FBiH,the RS and the BD adopted a set of environmental laws that are the basis for drafting subordinate legislation at all levels. Despite the accomplishments reached so far, certain areas are still unregulated by legislation.

Besides the adopted legislation, by-laws, regulations and procedures and ratification of numerous international agreements, during the period 2000 to 2012 a significant number of strategic documents were drafted, showing continuing efforts of BiH in achieving reform in the environment sector.

Countries and regions

Bulgaria

Main themes and sectors addressed in the national State of Environment report

The national report on the state and protection of the environment is drafted annually in accordance with the Environmental Protection Act[1].

> The report consists of 16 units and contain information mainly about: Air quality, Climate change, Water quality and Water resources management, Land use and soil state, Forests, Waste, Radiation characteristics of the environment, Noise pollution, Energy production, Transport and etc.

The report is structured on the base of environmental indicators and methodologies, implemented in the assessment reports of the European Environment Agency (EEA). The indicators assessment is done at appropriate time periods and gives trends and conclusions, forming the "key messages" under each relevant environmental topic.

Key findings of the State of Environment report [2]

Industry's use of energy and natural resources has had a significantly harmful impact on the environment.

Despite the decrease in Bulgaria's energy intensity, it nevertheless remains high among European Union (EU) Member States. Based on Eurostat data in 2012 the share of renewable energy (RE) use in Bulgaria reached 16.34% as a part of the country's total energy consumption.

Table 1: Share of renewable energy use in Bulgaria

Year	2005	2006	2007	2008	2009	2010	2011	2012
RE ktoe (normalized)	1048	1118	1067	1183	1205	1429	1515	1680
RE share from total energy, %	9.54	9.74	9.43	10.72	12.44	14.40	16.64	16.34

Energy production remains the biggest source of sulfur dioxide emissions and one of the largest for nitrogen oxide emissions. The domination of road transport in the overall transport structure, together with its ongoing growth, is linked with an increase in fuel consumption and emissions of harmful substances in the ambient air, including greenhouse gas (GHG) emissions, ozone precursors, and particulate matter (PM). In the transport sector, road transport is responsible for 92.54% of the total energy use. An increase in the use of bio-fuels in transport was first noticed in 2012.

Pollutants such as PM, ozone, sulfur dioxide, nitrogen oxides, ammonia, and non-methane volatile organic substances create enormous problems for human health. Such pollutants are responsible for a deterioration in ecosystems with PM_{10} the worst offender. For the period 1990-2012 the PM_{10} precursor emissions decreased by 66%, from 885 kt to 303 kt.

Bulgaria is implementing the requirements of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to decrease GHG emissions by 8% for the period 2008-2012, compared to 1988.

> Compared to other EU Member States, Bulgaria is distinguished by its relatively large quantities of water resources both as an absolute volume and per capita. At the same time the country has one of the highest water abstraction per capita and relies mainly on surface water sources due to the big volumes of water used for cooling in the energy production.

99% of the population has access to drinking water. After 2005 the number of Watewater Treatment Plants increased. During the past decade a gradual improvement in the quality of surface and ground water has been seen. There are still water bodies at risk and measures are in place aiming to reach good ecological status by 2015.

The country's soils have good ecological status. Water erosion, both as a territorial spread and as an average annual soil loss, has been noticed. Wind erosion has been kept at a constant.

On biodiversity, complex indicators for population trends are used in order to assess the degree of any loss. There has been a decrease in the population status of birds. The protected zones have been assessed as sufficient in regard of the representativeness of the species and the habitats.

The state of forests does not dramatically differ from the average European level. 24.2% of trees in Europe are classified as damaged, while in Bulgaria it is at 21.6%. Insects and fungal pathogens are the most responsible.

The analysis of the data for the daily noise levels measured in cities for a five year period shows that the prevailing ones are in the range 63-67 dB(A), followed by the ones at 68-72 dB(A). The measurements made by the regional health inspectorates show that the regulated admissible noise levels are exceeded in 69% of the control points around the country.

Preventing waste generation affects and depends on a wide range of stakeholders. This objective is included into national targets and is supported by the engagement of the local authorities, but ultimately depends on changing attitudes and behavior of households and businesses and on the new models in the industrial processes and the product design. There was a significant increase in the proportion of waste delivered for recovery including recycling and the quantity of hazardous waste generated in the past five years decreased by an average of about 26%. The amount of generated waste in the country decreased mainly due to administrative, economic and financial instruments. The country has achieved national targets for material recycling and recovery of packaging waste.

> The cost of protecting and restoring the environment at the national level is estimated at EUR 866 million. This is equivalent to a share of 2.2% of gross domestic product (GDP). The cost has increased by 17.8% compared to 2011 and by about 32.9% compared to 2010.

Main policy responses to key environmental challenges and concerns

In Bulgaria emphasis is increasingly placed on national environmental protection and the prevention and adaptation to climate change. The main legislative initiatives intending to increase the efficiency of the governance of environmental policies and to improve the business environment are:

- Law on limiting climate change[3], which will provide the general legal framework to implement the climate policy and the main activities and processes by which the Republic of Bulgaria is fulfilling its obligations in the field of climate change at the international level and at the European Union level.
- draft amendments to the Protected Areas Act, Medical Plants Act and Biodiversity Act, to reduce the regulatory and administrative burden of regulatory regimes in relation to biodiversity conservation.

- proposal for amendments to the Water Act, which mainly aims at accelerating the process of determining the sanitary - protective zones around water intake facilities for drinking water, full harmonization of the framework for Community action in the field of water policy and implementation of new higher environmental standards for water.
- Amendment to the Law on the responsibility to prevent and remedy environmental damage, which are included in the Draft Law amending the Law on Genetically Modified Organisms[4] in order to ensure effective control over the prevention and remedying of environmental damage.
- A new Waste Management Act[5], which updates the requirements for waste management and establishes national targets for recycling of household and construction waste.

Priority: Protection and improvement of water resources status

Providing further development and implementation of specific economic principles such as "polluter pays" and the principle of cost recovery in the water sector. Creating a strategic framework to reduce and prevent the adverse effects of flooding on human health, on the environment, on economy and on cultural heritage of the country and the development of Plans for Flood Management.

Priority: Sustainable waste management

Building a comprehensive infrastructure for waste treatment in the country and creating a strategic framework for waste management to determine future measures for waste generation prevention, promote recycling and reuse of waste and more efficient use of resources, the development of sustainable systems for management of specific waste streams and investment promotion activities associated with waste management.

Priority: Improve air quality

Implementation of the measures of the national programme to reduce total annual emissions of sulfur dioxide, nitrogen oxides, volatile organic compounds and ammonia in ambient air and methodological support to municipalities in developing programs to improve air quality and the implementation of already developed ones.

Priority: Limitation and halt the loss of biodiversity and the degradation of ecosystem services

Completion, maintenance and management of the national ecological network of protected areas and zones in order to ensure territorial protection, conservation, strengthening and restoration of ecosystems, habitats, species and genetic material, development and adoption of action plans for plant and animal species and management plans for protected areas and protected zones.

Country specific issues

The five headline targets of the "Europe 2020" strategy are adopted and transposed in national objectives and current situation and the targets for Bulgaria are following:

Table 2: National objectives in line with the "Europe 2020" strategy"[6]

"Europe 2020" strategy objectives	Present situation	Objectives of the National reforms program 2020[7]
3% of the GDP of EU goes for investment in scientific and research and development activities	0.6% (2012)	Increase up to 1.5%
20% decrease of GHG emissions compared to 1990 levels	minus 12% (prognosis for emissions in 2020[8] given 2005=100)	Increase with 20% max for sectors outside the ETS[9] (given 2005=100)
	plus 11% (emissions in 2010 given 2005=100)	
20% share of the RES in final energy consumption (incl.10% RES in the end consumption in transport)	16.4% (2012)	Increase the share to 16%
20% increase of the energy efficiency	17.4[10] Mtoe (2010)	Decrease with 3,2 Mtoe=15,8 Mtoe
75% employment of the population aged 20-64	63.5 (2013)	Increase the employment to 76%
Under 10% share of the early school leavers	12.4% (2013)	Decrease the share to 11%
At least 40% share of the aged 30-34 completed university	29.1% (2013)	Increase the share to 36%
Reducing the number of people living at risk of poverty or exclusion with 20 million	41.6% of the population	Decrease with 260,000

Countries and regions

Croatia

Main themes and sectors addressed in the national State of Environment report

Pursuant to the Environmental Protection Act, the State of the Environment Report[1][2] is produced by the Croatian Environment Agency[3] every four years. The Ministry of Environmental and Nature Protection submits the report to the Government and the Government forwards it to the Parliament. It is an indicator-based report[4] aimed at monitoring the objectives of the Environmental Strategy and Action Plan.

The report comprises three parts:

- **Environmental Components** (Air, Climate Change, Water, Sea, Soil, Biodiversity, and Environment and Health)
- **Sectoral Impacts** (Area and Population, Energy, Industry, Agriculture, Forestry, Fisheries and Aquaculture, Hunting, Transport, Tourism, Chemicals, and Waste Management)
- **General Environmental Protection Issues** (Legislative and institutional framework, Policy implementation and instruments, Environmental Inspection, Investments, Education)

The report provides conclusions and recommendations to decision-makers, and provides information on the state of the environment to professionals and the general public.

Key findings of the State of Environment report

Emissions of major pollutants to the **air** are showing a decreasing trend[5]. In urban areas, the air is mostly clean or only slightly polluted (category one). But in some urban areas, it is moderately or overly polluted due to air pollution with particles of PM_{10}, NOx and ground-level ozone. In regional terms, Croatia is in an unfavorable situation because trans-boundary pollution contributes to problems with eutrophication and ground-level ozone.

Croatia has achieved the target set by the Kyoto Protocol, with a trend of reduction in emissions of **GHGs**. The share of renewable energy in gross final total energy consumption is 20,2%.

The number of known **taxa** amounts to 40,000 and 3,984 of these have 'protected' or 'strictly protected' status. A total of 8.4% of Croatia's territory is under some category of nationally designated protection. The **ecological network** Natura 2000 includes 36.9% of Croatia's land territory and 16.6% of its territorial sea.

Losses in the public **water** supply system are significant (amounting to 48% in 2012). Although there are limitations in the surface-water monitoring system, the status of surface waters appears to be better in the Adriatic than in the Danube River Basin District[6]. Groundwater quality is good. 82% of Croatians have access to the public water supply system, and 46% have access to public sewage systems.

The ecological status of the Croatian part of the **Adriatic Sea** is mostly of the highest quality (oligotrophic) [7]. According to the annual EEA report, the **sea** bathing water quality at Croatian beaches was rated as one of the best in Europe.

Fisheries are a significant element of the traditional lifestyle in the coastal areas and islands of Croatia. The state of the

fish stocks in the open sea of the Adriatic, especially in the area around the island of Jabuka (a natural spawning area and nursery habitat of commercial fish stocks) and in the Ecological and Fisheries Protection Zone (ZERP[8]) is unfavorable.

Croatian **tourism** is mostly seasonal, occurs in coastal counties (96%), and is continuously growing (in 2012, there were nearly 12 million visits and 63 million overnight stays). Each year protected areas (e.g. national parks, the Plitvice Lakes, Krka, and Kornati) attract more visitors. Cruising and nautical tourism are the fastest-growing types of tourism and require efforts for adequate management of the marine environment.

In 2012, municipal **waste** amounted to 390 kg/per capita (below EU-27 averages)[9]. The share of the population with access to organized waste collection is 99%. Since 2006 there have been improvements in special category waste management, but for some categories (e.g. construction and biodegradable waste) there is still a need to ensure better management. Landfilling is still the prevailing type of waste treatment, although there has been an increase in separately collected and recovered fractions of municipal waste.

Main policy responses to key environmental challenges and concerns

The Air Quality Protection and Improvement Plan 2008-2011 has brought improvements in monitoring (e.g. 12 background stations were built). In 2013 the new **air** plan for the period 2013-2017 was adopted, which contained specific priority measures (e.g. strengthening the capacity of local and regional authorities to improve air quality, measures to reduce emissions of NOx, NH_3 and $PM_{2,5}$, etc). Since reducing air pollution greatly depends on reducing pollutant emissions in the other countries, especially neighbouring ones, Croatia is interested in successful international cooperation.

The Air Quality Protection and Improvement Plan 2008-2011, established the ETS in Croatia. Implementation of energy efficiency measures and of renewable energy projects conducted by the National Energy Efficiency Programmes is reducing **GHG** emissions and bringing significant energy and financial savings. However, measures for carbon capture and storage and for reducing emissions from transport have yet to be implemented. A low-carbon development strategy is currently in the drafting phase.

The main activities of **nature protection** were related to the preparation of Natura 2000. For that purpose, extensive research work was initiated, with a focus on inventorying biodiversity and establishing the framework for monitoring. The new Nature Protection Act was adopted in June 2013 while the Regulation on Ecological Networks was adopted in September 2013.

The Water Management Strategy gives the framework for sustainable **water** management and protection of water resources. One of its strategic objectives is reducing losses in the public water supply system. According to the requirements of the WFD, the Croatian River Basin Management Plan was adopted in 2013. In comparison to 2008 the total number of UWWT plants increased. A transitional period for the fulfilment of the UWWTD requirements ends in 2023.

The Regulation for establishing a framework for protection of the **marine environment**, which assumes the obligations arising from the MSFD, was adopted. Activities for the establishment of a monitoring and observation system for ongoing assessment were carried out. Sea bathing-water quality is systematically monitored in accordance with the Bathing Water Directive.

Since **tourism** is most intense on the coast, measures to boost inland tourism have been introduced. Sensitive protected areas are subject to a special management approach. Considering the strong growth of nautical tourism, Croatia has opted for a more moderate development scenario and data indicate that this goal will be fulfilled.

Almost all commercially important fish stocks in the Adriatic Sea are in the category of "shared stocks" (exploited by the fleets of different countries). Given the negative trends in biomass, it is necessary to reach agreement in order to establish the long-term sustainable management and protection of resources in the Adriatic Sea. Croatia implements the common **fisheries** policy (Council Regulation 2371/2002).

In 2013, the new Act on Sustainable Waste Management (OG No. 94/13) was adopted, which should contribute to the further improvement of **waste** management practices in Croatia. This Act promotes the revision of existing ordinances regulating the management of specific waste categories, which will hopefully result in the faster achievement of certain goals and targets. Activities continue in areas such as the closing down and remediation of existing official landfills and illegal waste dumps, the rehabilitation of locations polluted by hazardous waste, and the construction of waste management centers.

Country specific issues

> In order to conserve Croatia's natural resources and environment, in 2008 Croatia has adopted legislation to establish the foundations for a more comprehensive and detailed overview of impacts on the environment. The legislation covers a much broader range of activities and includes a greater number of pollutants (128). For many of these pollutants, the new concentration threshold is significantly lower than that prescribed by EU and UN regulations.

Furthermore, the Environmental Pollution Register[10] was established in 2009, and has continued to develop ever since. In 2012, the Croatian National Portal of the EPR[11] was published. Apart from giving a transparent overview of polluters and their locations, the release and transfer of pollutants, and the transfer of waste, the portal also provides a GIS browser service, i.e. it gives up-to-date online information on the spatial components of these phenomena and related information, with the possibility of making spatial analyses and reports.

Countries and regions

Cyprus

Main themes and sectors addressed in the national State of Environment report

The National State of the Environment Report (SoER) is prepared in accordance with the provisions of the Law on public access to environmental information (N. 119(I)/2004) and must include information on the quality of, and the pressures on, the environment. The following environmental themes are covered: atmospheric environment, climate change, water resources, marine and coastal environment, nature and biodiversity, land use, energy, waste, transport, and environmental noise. The indicators are determined on the basis of monitoring data and trend availability for each thematic area. The 2015 SoER is currently under preparation.

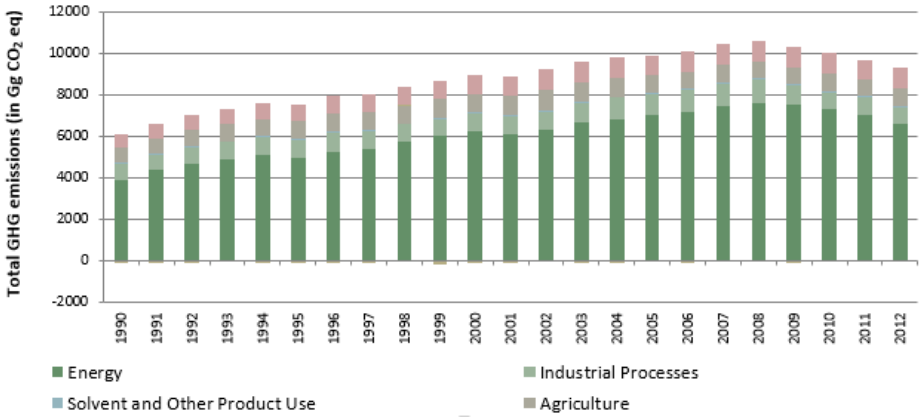
Key findings of the State of Environment report

Climate Change

Cyprus is a country already experiencing climate change, especially through extensive droughts and the associated impacts on water supply, biodiversity and other sectors.

According to the latest inventory submitted to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat[1], the total national emissions of the country increased by 52% between 1990 and 2012.[2] Since 2008, however, total emissions have been reducing by an average of 3% annually, primarily due to the financial situation of the country and the impact of the promotion of renewable energy sources (RES) (Figure 1). Energy remains the largest source of emissions (71%) of which 54% is from the production of electricity and 32% is from road transport.

Figure 1: Total national GHG emissions by sector 1990-2012 (including LULUCF)



Source: Submission to the United Nations Framework Convention on Climate Change secretariat , 2014

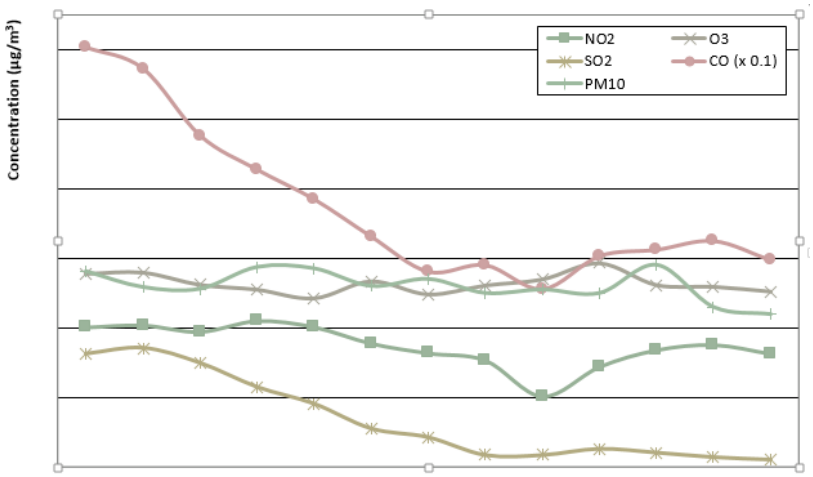
Nature and Biodiversity

Cyprus designated 40 Sites of Community Interest (SCI) and 30 Special Protected Areas (SPA) for their inclusion in the Natura 2000 Network, in order to implement the Habitat Directive 92/43/EC and the Birds Directive 2009/147/EC. Information regarding the conservation status of habitats and species in Cyprus can be found in the Report compiled according to Article 17 of the Habitats Directive.[3]

Air Quality and Air Pollution

The Department of Labour Inspection operates a network of nine monitoring stations for the measurement of Ozone, Nitric Oxide, Nitrogen Dioxide, Nitrogen Oxides, Sulphur Dioxide, Carbon Monoxide, BTEX, Particulate Matter (PM), and meteorological parameters and four mini stations for the measurement of Ozone, Nitric Oxide, Nitrogen Dioxide, Nitrogen Oxides and PM. The measurement results are made available to the public together with other useful information on air quality through a dedicated air quality website.[4] The assessment of air quality measurements shows an improvement of air quality in Cyprus (Figure 2). Most of the air pollutants do not exceed the limits, with the exception of Ozone and PM_{10}.

Figure 2: Annual averages of NO_2, SO_2, PM_{10}, O_3, CO at Nicosia Traffic Station



Source: Air quality in Cyprus

The Ozone exceedances of the 8-hour target value, observed mainly in non-urban areas, are primarily due to transboundary pollution and due to climate conditions prevailing in the Mediterranean area.

PM_{10} exceeds both the annual and the daily limit value all over Cyprus. These exceedances are due to natural sources (sea salt), transboundary pollution (i.e. Sahara dust storms) and anthropogenic sources.

Regarding the emissions of different pollutants in Cyprus, the main contributors are road transport, public electricity and heat production and industrial sources.

Energy

Targets:

- Achieve an increase of 14.3% (463 ktoe) in energy savings in the projected primary energy consumption of the year 2020. **Reached 12.3% in 2012 compared to 4.3% in 2011.**

- Increase of the contribution of RES to 13 % of the total energy consumption by the year 2020. **Reached 7.7% in 2012 compared to 6.8% in 2010.**

Waste

Due to very high consumption patterns Cyprus has one of the fastest rising waste generation rates. The environmental, health and socioeconomic impacts of the uncontrolled disposal of waste are also considerable given the size of the island. The reduction of waste generation rates and their management according to the waste hierarchy is therefore a priority.

Over the period 1996 to 2011 the total amount of municipal waste generated increased from 400.12 tons to 579.68 tonnes (by over 44.8%). Recent data shows that the growth rate of residual waste has been reduced however due to the increase in separate collection (mainly packaging and WEEE) and energy recovery.

Reducing waste generation remains a key priority for future waste management. In 2011 the per capita waste generation reached 683 kg/cap/y, one of the highest rates in EU.

Main policy responses to key environmental challenges and concerns

Climate Change

The preparation of the national adaptation strategy is expected to conclude by the end of 2014. Concerning mitigation of greenhouse gas (GHG) emissions, until 2012 Cyprus was the only country in the European Union that did not have a commitment. However, in 2009 Cyprus committed to reduce non-ETS emissions by 5% by 2020 compared to 2005 through the Effort Sharing Decision. In 2013 Cyprus was included in the Annex I to the UNFCCC thus committing internationally to take action to reduce emissions.

Consistent with the Government's progressive approach to the development of national climate policy, the primary focus for securing compliance with EU law in the period to 2020 will be domestic mitigation.

Measures include the introduction of natural gas to Cyprus, primarily for use in electricity generation, increase of the Renewable Energy Sources' (RES) share to electricity, heating, cooling and transport, promotion of public transport and low emission vehicles and improvement of solid waste disposal sites etc.

An ad-hoc committee has been set up for the detailed revision of the policies and measures already in place, into a more detailed strategy for the reduction of GHG emissions.

Nature and Biodiversity

The most serious threats to nature and biodiversity in Cyprus are the effects of climate change, land use change, invasive species, illegal hunting, long drought periods and forest fires. Residential development, infrastructure, tourism and quarrying are among the most serious threats that ecosystems are facing today. Furthermore highway and rural road construction has led to habitat loss and a fragmentation of nature areas.

By 2014, most of the Natura 2000 areas will be designated as Special Areas of Conservation (SAC) and Ministerial Decrees will be issued to ensure stricter protection and enforce new restrictions on anthropogenic activity within the areas.

Air Quality and Air Pollution

To address the anthropogenic contribution, Cyprus has prepared a National Action Plan[5] with specific measures to limit PM emissions.

For the reduction of air pollution in Cyprus, several measures have been established taking into consideration mainly the provisions of Directive 2010/75/EU in relation to emission limit values.

In 2009, Cyprus provided an update of the national critical load data. About 40.5% of the area of Cyprus is covered by forests and other (semi-) natural vegetation for which critical loads of acidity and nutrient nitrogen are computed.

Energy

The introduction of natural gas to the national energy system will be a major contributor to the energy efficiency target. Other measures include grant schemes for energy saving and domestic generation for RES in all sectors, measures focusing on road transport and the implementation of new EU policies.

Measures for increasing the contribution of RES to the gross final energy consumption by 2020 are ongoing. Currently, efforts focus on a pilot project announced by the Cyprus Energy Regulatory Authority (CERA) in 2012 for examining the effects of Net-metering.

Waste

According to legal requirements, the Department of Environment has prepared the Waste Management Strategy, the Waste management Plan for municipal waste and the Waste Prevention Program.

Country specific issues

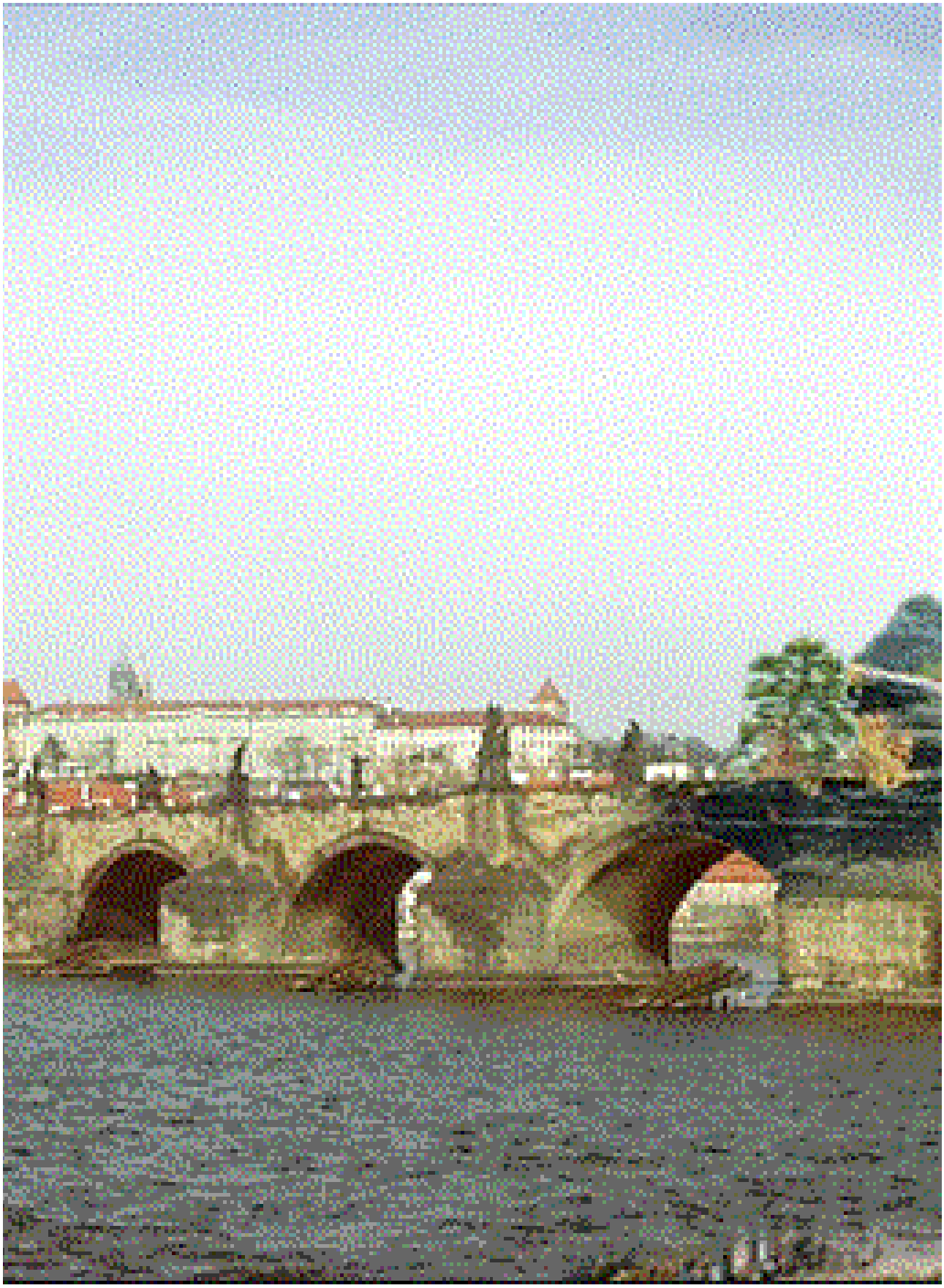
The marine environment is of particular importance for Cyprus, both for environmental as well as economic reasons given the dependence of the island on tourism.

The status of the marine and coastal environment of Cyprus is evaluated from Good-High environmental ecological status, based on the implementation of the Water Framework Directive (2000/60/EC) and physico-chemical parameters, along with various monitoring programs such as the Med POL of UNEP/MAP and Impact Environmental Assessments. Cyprus has completed the 1st phase of the Marine Strategy Framework Directive.[6]

According to the stock assessment results until 2010 the stock level of four of the most commercial fish species in Cyprus was in "over-fishing" status. The fishing mortality (F) for each species was greater than the fishing mortality threshold (F0.1).

Cyprus has established 6 marine Natura 2000 sites and implements monitoring programs under the EU Habitats Directive (92/43/EEC) for species such as the Mediterranean Monk Seal and Marine Turtles, as well as for marine habitats such as the Posidonia meadows and sea caves. In addition, the mapping of Posidonia oceanica has also been implemented in all the marine Natura 2000 areas.

The implementation of the Marine Strategy Framework Directive is a challenging task due to the limited human and economic resources. The effective management of the marine Natura 2000 areas as well as all the marine protected areas significantly contributes towards the objectives of maintaining good marine water status.



Countries and regions

Czech Republic

Main themes and sectors addressed in the national State of Environment report

The State of the Environment Report (SoER) of the Czech Republic is a basic reporting document of the Czech Republic. The SoER is published annually on the basis of Act No. 123/1998 Coll., on the right to information on the environment, and on the Resolution of the Government No. 446 of the 17th of August 1994. The SoER has to be published within three months of receiving government approval. The methodology of the SoER is indicator-based. The indicators cover the following main environmental themes:

- Atmosphere and Climate
- Water management and water quality
- Biodiversity
- Forests
- Soil and Landscape
- Industry and Energy
- Transportation
- Waste and material flows
- Financing

The set of indicators used is constantly being adapted to the needs of the Czech Republic's current national environmental policy, to the EEA's core set of indicators, to environmental problems, and to the availability of the source data sets. CENIA, Czech Environmental Information Agency, is responsible for producing the SoER.

Key findings of the State of Environment report

> The state of the environment in the Czech Republic is improving. There has been a long-term trend of decline in emissions of acidifying substances, ozone precursors, primary particles, secondary particulate precursors as well as greenhouse gas emissions from the manufacturing industry. Pollution of surface and groundwater has also been following a trend of long-term decline.

Air pollution is closely linked to developments in household heating, transport, the energy sector and the industrial sector. In the energy sector, electricity and heat generation from renewable energy sources has been growing, especially due to photovoltaic power stations as well as biogas stations. However, the generation of electricity in coal-fired power stations and associated environmental pollution is declining only very slowly.

Despite this decrease in emissions, emissions still cause acidification of ecosystems and agricultural land, and defoliation of forest stands. NO_x emissions are also a precursor to ground-level ozone, which damages plants and reduces their resistance to stress factors of the environment.

Air quality in certain regions and localities still remains unsatisfactory. Household heating is a major, and difficult to regulate, source of emissions of PM10. It produces roughly 40% of particulate matter emissions. Main issues are obsolescence and low efficiency of combustion in heating units and to some extent behavioural traits of households.

There is still high pressure on the landscape connected with land-use development, particularly in large urban areas, and with the construction of transport infrastructure, which are both associated with allocation of agricultural and forest land resources for construction activities. This has increased landscape fragmentation and increased pressure on plant and animal habitats. As a result, migration patterns of animals are changing and there has been an overall decline in biodiversity.

The increasing extent of built-up areas also disrupts the ability of the landscape to retain water and protect against floods. Water retention in the landscape is essential for recharging water resources, which are important for drinking water supply and agriculture.

Positive developments include the decline in water consumption, and the improving quality of surface water. Although a growing share of wastewater is being treated, pollution from non-point sources – in particular agriculture – is growing.

The total waste production has had stagnating to slightly decreasing trend. Although landfilling still remains the main common method of municipal waste management, the trend is decreasing in favour of material and energy recovery.

Main policy responses to key environmental challenges and concerns

The main policy responses are defined in **the State Environmental Policy of the Czech Republic 2012–2020**[1], which sets a framework for the effective protection of the environment in the following main areas:

- Protection and sustainable use of resources
- Climate protection and improvement of ambient air quality
- Protection of nature and landscape
- Safe environment

A large amount of financial resources and legislation effort has been spent in improving ambient air quality in locations where air quality limit values were being exceeded. The aim of this effort is to improve or maintain air quality and reduce emissions of the main polluting substances into the air, with an emphasis placed on the use of environmentally friendly energy generation and energy efficiency.

Nevertheless an increase in fuel and energy prices forced households to re-evaluate their heating methods and return to solid-fuel heating (brown coal and wood, but also municipal waste and fuels with worse quality). This shift led the government to offer financial support for the replacement of old boilers for environmentally-friendly boilers and also to offer financial support for people to install domestic insulation.

The Czech Republic has also given significant support[2,3] to renewable energy in the last few years. This support has led to a growth in electricity generation from photovoltaic cells as well as from biomass. Construction of photovoltaic stations on agricultural land has changed land-use categories and led to the extensification of agricultural land. The financial support for biogas energy stations caused a risk for agriculture. Agricultural commodities (e.g. crops, rape) are now produced for energy use (biofuels or electric power made from biomass) instead of for human consumption. The support to the new RES has been adjusted accordingly.

Country specific issues

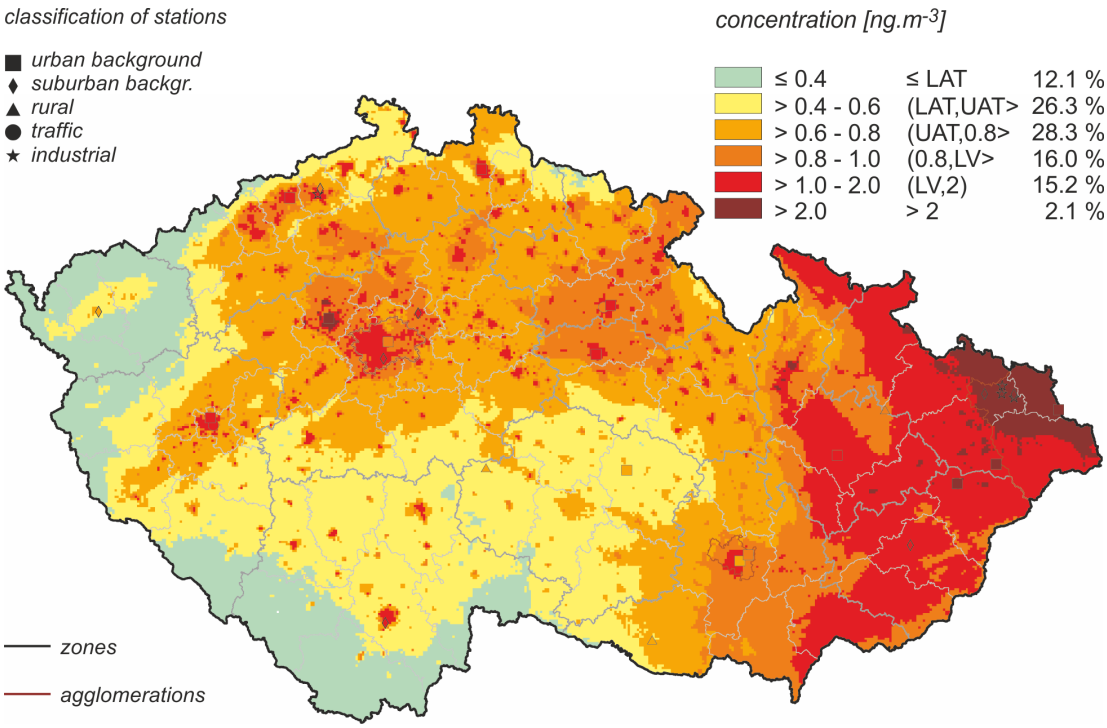
The Czech Republic pays particular attention to the elimination of air pollution because air quality has a direct impact on public health.

The main problems of air quality in the Czech Republic are benzo(a)pyrene (Figure 1), $PM_{2.5}$, PM_{10}, and surface ozone. Besides transport, the main sources of benzo(a)pyrene and $PM_{2.5}$ is residential fuel combustion. According to the Czech Hydrometeorological Institute, 15% of households use solid fuels for heating. This percentage is declining only very slightly. As a consequence of this trend, local heating represents a significant source of primary particulate matter (PM), especially $PM_{2.5}$, and produces over 80% of the Czech Republic's benzo(a)pyrene emissions. Air quality deteriorates considerably during the winter due to worse dispersion conditions.

In 2013, a number of towns and villages were assessed for benzo(a)pyrene concentrations. In 2013, the benzo(a)pyrene limit value was exceeded in 17.3% of the territory of the Czech Republic (in 2012 it was exceeded in 26.5% of the territory of the Czech Republic). The percentage of inhabitants exposed to the above-the-limit benzo(a)pyrene concentrations in 2013 is estimated at 54.5% (in 2012 it was approximately 66.3%). The highest annual average concentration in 2013 was measured in the industrial locality Ostrava-Radvanice ZÚ (9.4 $ng.m^{-3}$). Above-the-limit concentrations are also reached in traffic localities as well as in the background urban and suburban locations (Czech Hydrometeorological Institute, 2014).

It is necessary to consider that estimates of annual average benzo(a)pyrene concentrations are highly uncertain due to insufficient density of measurement and an absence of measurements at rural air-quality monitoring stations. Further uncertainty is caused by the absence of measurements in small settlements in the Czech Republic. 48% of Czechs (Czech Statistical Office, 2013) live in small settlements (villages and towns of 10 000 inhabitants or less), where the use of solid fuels for household heating represents a significant source of benzo(a)pyrene.

Figure 1: Annual average concentration of benzo(a)pyrene in the ambient air in 2013



Source: Czech Hydrometeorological Institute

Countries and regions

Denmark

Main themes and sectors addressed in the national State of Environment report

The Danish SOER[1] provides an overview of the current state and describes trends and indicators. This helps to provide clarity and perspective for politicians, interest groups and citizens. The SOER is an independent analysis prepared by a third party.

The main themes of the 2014 report are covered within 10 thematic chapters:

- Land use,
- Air,
- Water,
- Sea,
- Climate change,
- Nature and Biodiversity,
- Natural Resources,
- Environment and Health,
- Production, Consumption and Waste,
- Environmental policy.

Key findings of the State of Environment report

> The 2014 SOER concludes that in some areas the environmental status has considerably improved over recent years and decades. Nevertheless significant challenges remain.

The content of pesticides in ground water has been reduced; the air has become significantly cleaner and the state of Danish lakes and streams has improved. However, these improvements are not sufficient to meet the objectives for water bodies, biodiversity is under pressure, a great part of Danish nature is still in an unfavorable condition, and resource consumption is among the highest in the world.

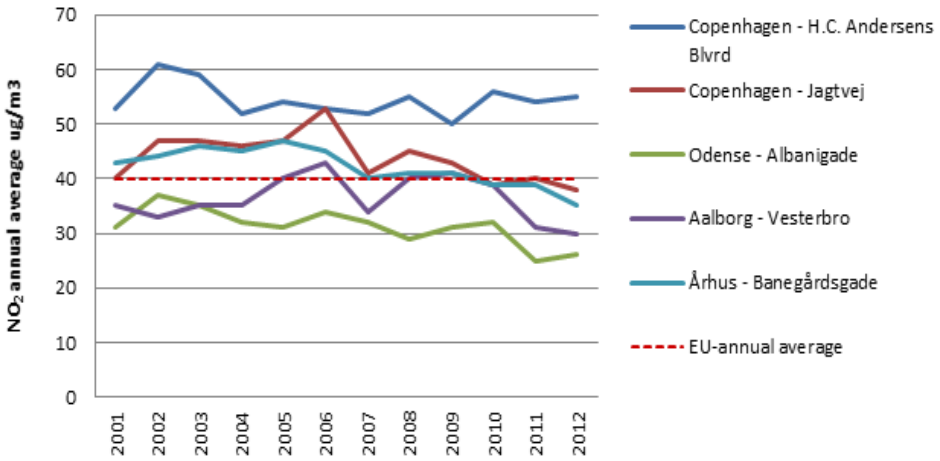
Land use

Agriculture occupies more than 60% of Denmark's area. Forest area is increasing and approximately 14.1% of Denmark's total area is covered by forest. The nitrogen load is decreasing, but the use of pesticides still exceeds national targets. Over the past 18 years the area of organic farming has increased approximately by a factor of 4½.

Air

Air quality is overall improving, but remains a challenge in densely populated areas. Emissions of nitrogen oxides, volatile organic compounds, sulfur dioxide, and heavy metals are decreasing. Fine particles, especially from wood stoves and diesel driven means of transport, continue to pose a challenge. In Copenhagen NO_2 levels remain above the EU limit values (see Fig. 1).

Figure 1: NO_2 levels in Copenhagen, 2001-2012



Source: Natur og Miljø 2014

Water

Danish water consumption has decreased by 25-30% over the last 20 years. The environmental state in Danish lakes and streams has improved over the last 20 years. The condition in lakes and coast waters is still affected by excessive inputs of nutrients and hazardous substances and streams by poor physical conditions and inputs of organic matter. Groundwater condition has generally improved. Residues of pesticides and excess nitrate, however, still cause problems in parts of the groundwater resource.

Sea

The land based discharge of nitrogen to the inner Danish waters has been reduced by approximately 50% since 1990. Despite this effort many areas still suffer from an oxygen deficit. Overall, fishing has become more sustainable, however a number of stocks including the cod still remains under pressure. Contamination with pollutants such as TBT (tributyltin) and PAH (polyaromatic hydrocarbons) in blue mussels is declining, but the concentration of mercury is still above the environmental quality standards.

Climate change

Changes in the global climate have been particularly pronounced in recent years. Emissions of greenhouse gases (GHG) have started to decline. Total emissions have decreased in the period 1990 to 2012, while the global concentration of CO_2 in the atmosphere continuously sets new records. Temperature, annual precipitation and the number of storms have increased and the sea levels have risen.

Nature and Biodiversity

Open natural habitats are threatened by the impacts from nutrients which lead to overgrowth and a few dominant nutrient-requiring species of vegetation. Biodiversity continues to decline in many spheres but there are also some areas in which the speed of decline has slowed. Nutrient discharge into watercourses, lakes and seas has been significantly reduced since 1990, and there are signs of positive development in the biodiversity of aquatic environments.

Natural resources

Material consumption per capita has declined since 2006 and is on par with the levels of the late 1990s. Denmark's global ecological footprint has also decreased slightly, but remains one of the world's largest. Total energy consumption has decreased by 7% from 1990 to 2012. Denmark's share of renewable energy was 23% of total energy consumption in 2012 (not including incineration of waste).

Environment and health
In 2011 air pollution caused an estimated 3 200 premature deaths. There is still a need to reduce the risk of using chemicals. Unwanted chemicals can be measured in blood, urine and hair and they are, *inter alia*, under suspicion for being related to certain forms of hormone-related cancer diseases.

Production, Consumption and Waste
In 2013 production of green products generated a turnover of DKK 164 billion of which almost half is from renewable energy[3].

Denmark is one of the countries in Europe producing most municipal waste per inhabitant. The amount of total waste produced per capita per year is approximately 1.8 tonnes. A total of 63 % of this was recycled, 29 % was incinerated and 6 % ended up in landfills[12].

Transverse environmental themes
Public expenditure on environmental protection has decreased by approximately 20% over the past decade. The ratio of green taxes in relation to GDP has declined steadily from 2000 to 2012, but is still among the highest in the EU. Denmark is placed 13th in the Environmental Performance Index, above the European average.

Main policy responses to key environmental challenges and concerns

Nature

Afforestation: during the period 2010 to 2013 approximately 6 900 ha of forest (state and private) have been established. There is an emphasis on forests located close to cities.

Commission on Nature and Agriculture 2013: the Commission developed 144 recommendations on how to create development and growth in the agricultural industry and simultaneously boosting nature, the environment and climate action.

National Pesticide Action Plan 2013-2015: works towards a 40% reduction in pesticide load from 2011 to 2015, *inter alia*, by introducing a tax on pesticides.

Nature Fund: a National Nature Fund is under establishment with the purpose improving the state of nature and the aquatic environment in Denmark.

Nature Plan[4]: In 2014 the government launched Nature Plan Denmark, a new, long-term and comprehensive plan for how Denmarks nature becomes more rich and coherent. Among the initiatives is the development of a new Green Denmark map that will show where our existing and potential valuable natural and endangered animals and plants can be found, the establishment of approximately 25,000 hectares of new nature and a ban on spreading manure and use insecticides around 35,000 hectares of protected nature areas.

Climate

Initiatives on Climate: the government has drawn up a Climate Plan aiming to reduce GHG emissions by 40% in 2020 (compared to 1990-levels); a Climate Law that secures drive and transparency in reaching the 40%-goal; and a Climate Council to provide expert counselling on the path towards a low emission society.

The Energy Agreement 2012-2020: the initiatives follow the Government's long term commitment to ensure that energy supply in 2050 will be 100% based on renewable energy.

Municipality Agreement 2013 and Action plan for a climate-proof Denmark 2012: involves 63 national initiatives on climate change adaptation including law changes to assist the implementation of local adaptation action plans made by all Danish municipalities.

Chemicals

Chemicals initiative 2014-2017[5]: a total of DKK 185 million has been allocated to enhanced implementation and better regulation of SVHC in REACH, the establishment of a chemical-forum and other initiatives.

Resources

Resource strategy 2013[6]**:** The strategy is expected to result in 50% recycling of certain fractions of household waste.

Air quality

Tax on NOx emissions: a tax on NOx emissions was introduced in 2010. In 2012 the fee was increased from 5 DKK/kg NOx to 25 DKK/kg NOx.

Train Fund: 28.5 billion DKK has been set aside to improve the Danish railway system.

Clean air action plan: 149 million DKK have been allocated to, *inter alia*, cleaner buses in Copenhagen and targeted action to reduce particle pollution from stoves and ships.

Country specific issues

As the EU administrator of the **China Europe Water Platform**[7], Denmark prioritizes activities in order to improve cooperation on the management of water in order to secure water supply, food security and ecological security. The Danish government, together with the governments of Korea and Mexico, launched the **Global Green Growth Forum (3GF)**[8]. 3GF convenes governments, businesses, investors and international organizations to act together for inclusive green growth. Furthermore, Denmark has a leading position in **arctic research**, and works to ensure a sustainable future for the Arctic region in corporation with Greenland and the Faroe Islands[9].

Nationally a **Green Transition Fund** has been established to support the development of new business models, product innovation, re-designs of existing products and promoting sustainable materials in product designs. Also a fund for **Green Pioneers**, engaging civil society and organizations has been established.

The **national research and innovation policy** has a special focus on green innovation in the areas of energy, transport, agriculture and environment. In 2014, grant schemes are expected to provide DKK 1.5 billion in grants to development and demonstration of green technology.

A **Forum for Sustainable Procurement**[10] has been established to promote responsible and environmentally conscious procurement by professional purchasers. A **Partnership on Green Public Procurement**[11] has been launched as a cooperative measure between public institutions at municipal, regional and national level.

Countries and regions

Estonia

Main themes and sectors addressed in the national State of Environment report

Estonian Environmental Reviews are published by the Estonian Environment Agency (formerly known as the Estonian Environment Information Centre). Based on the Aarhus Convention, the Sustainable Development Act, the Public Information Act, the Environmental Register Act, and other acts, Environmental Reviews are compiled every four years. The first review was published in 1989 and the most recent one in 2013. The Estonian Environmental Review 2013[1] addresses the following areas:

- Socio-economic background
- Natural resources
- Weather patterns and climate change
- Waste
- Ambient air quality
- Changes in land use and urban ecology
- Biological diversity
- The environment and health
- Environmental management tools

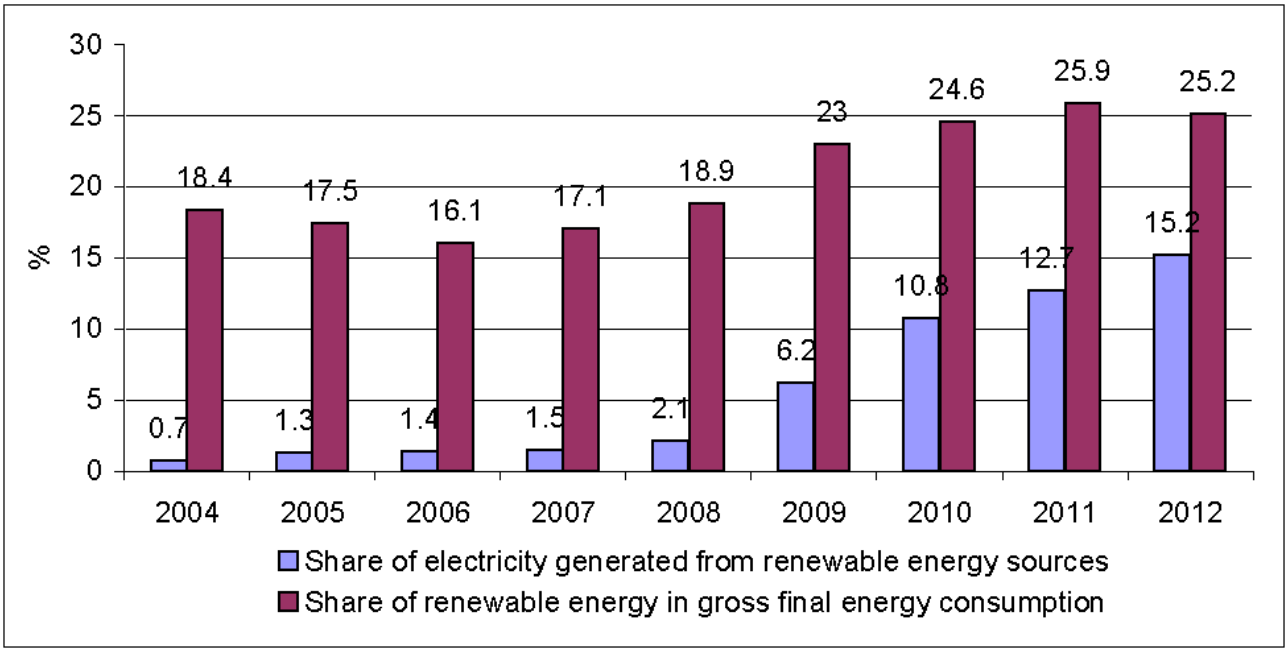
A more targeted and concentrated overview of the state of environment exists in the form of environmental indicator reviews. Environmental indicator reviews have been compiled three times: in 2007, 2009 and 2012[2].

Key findings of the State of Environment report

> The economic downturn that began in 2008 decreased consumption and production, thus also decreasing environmental pressures. However, these pressures have started to increase as the economy recovered. The challenge now is to ensure human well-being with less waste generation and more sustainable use of resources and without placing an excessive burden on the environment.

Oil shale-based energy production provides energy independence to Estonia, but it is very resource intensive. Noteworthy progress has been made by increasing the share of renewable energy in final energy consumption (Figure 1)[3]. The Estonian Environmental Strategy 2030 foresees the more extensive introduction of renewable energy and combined-heat-and-power plants. By 2020, the share of renewable energy should reach 25% of final consumption. The main sources of renewable energy are biomass, wind and hydropower.

Figure 1. Share of renewable energy in final energy consumption and share of electricity generated from renewable energy sources, 2004–2012



Source: Statistics Estonia[3]

The nature conservation status of both species and habitats of European concern has improved over the past five years – more than half of both species and habitats in Estonia are in favourable conservation status today. According to the Red List, 3% of all species registered in Estonia are endangered.

Areas with peat formation cover 22% of Estonia's territory, with open mires and bogs accounting for 5.5%; and the remaining 17% being composed of paludified forests, grasslands and degraded bogs. Natural and semi-natural meadows (those that are not intensively managed) cover about 2.5% of Estonia. 35.6% of these meadows have a high nature-conservation value. The average age of forests is decreasing and their structure as habitats is shifting away from being natural. This has resulted in the decline of species characteristic of old-growth forest ecosystems.

The majority of the population in Estonia consume good-quality, safe drinking water. The quality of water continues to improve as new water treatment plants are built and pipes are repaired and reconstructed. Estonia has sufficient freshwater resources. The main reason for the deterioration of waterbodies is eutrophication and hydromorphological changes (amelioration, impoundment of water bodies by dams, and alteration of the water regime).

The environmental condition of small lakes is mostly good. The reason that roughly one third of Estonia's lakes are in moderate status according to the Water Framework Directive (WFD) is the presence of nutrient concentrations and phytoplankton[4]. Approximately 70% of Estonia's rivers are at least in 'good' ecological status, although nitrogen concentrations are increasing in streams that drain agricultural areas.

Continuous monitoring of ambient air has shown that the quality of air is good. Emissions of SO_2, NOx, NH_3, heavy metals (Pb, Cd and Hg), and other pollutants have decreased during the period 1990-2012. Emissions of SO_2 decreased by 85.2% in this period[5]. The changes were caused by the restructuring of the economy in the early 1990s, which significantly reduced the amount of electricity consumed by industry. The use of local fuels (including wood, and oil-shale oil with a lower sulphur content compared to heavy fuel oil) and natural gas has been increasing since 1993. In the same period, the use of heavy fuel oil in the production of thermal energy has reduced. Due to energy security concerns, proportion of natural gas has remained small in Estonian energy mix. Recent developments in Estonian

biogas sector have increased the share of locally sourced biogas used for electricity and heat production[6].

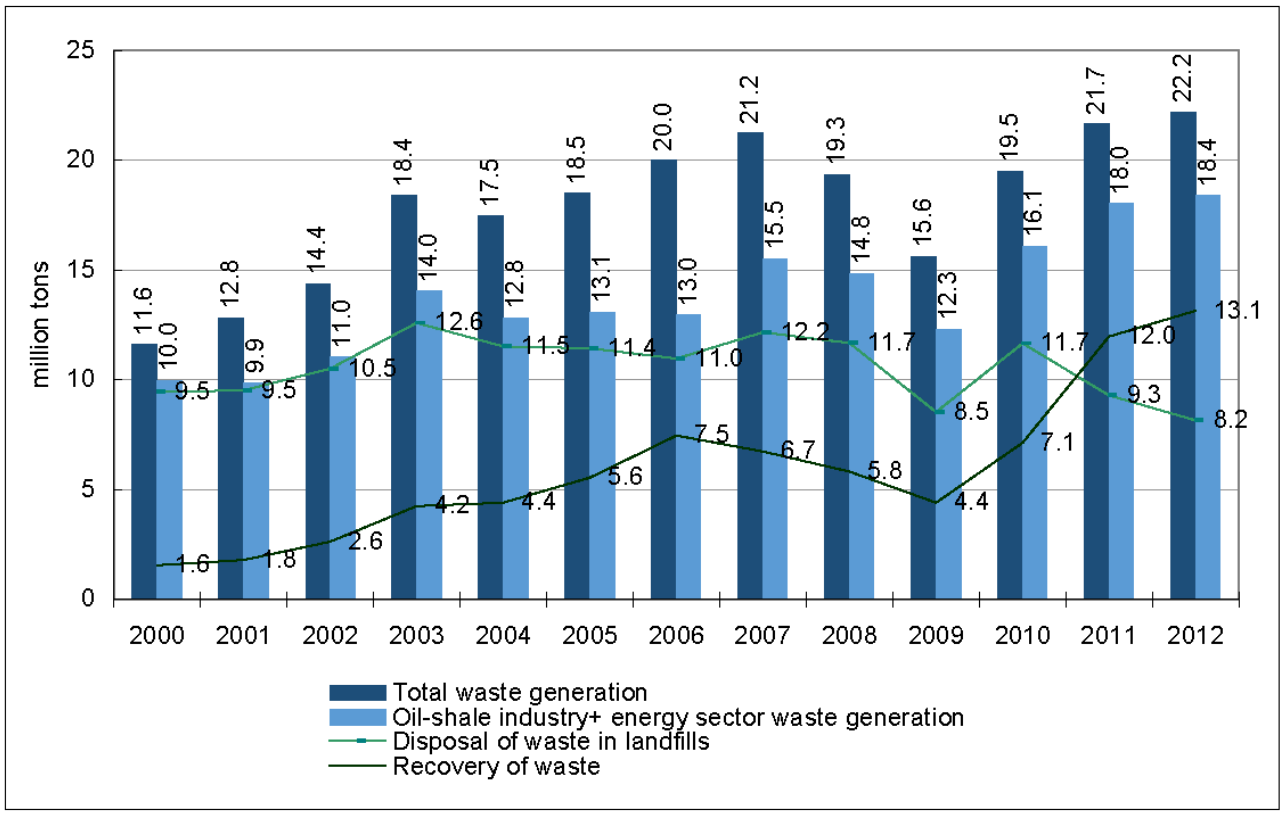
Estonia assumed the obligation to decrease annual SO_2 emissions from oil-shale power plants to 25 000 tons by 2012. Unique desulphurisation systems were installed on four generating units of the Estonian power plants and the goal was met[7]. Emissions of NOx and ammonia have dropped by 56% between 1990 and 2012. Emissions of particulate matter and lead decreased by 90% and 84% respectively in the same period.

The effects of climate change are less extreme in Estonia than in many other countries. Nevertheless, there could still be changes in weather patterns such as temperature and rainfall changes, storms, and resulting floods. The main contributor of greenhouse gases is CO_2 from the oil shale-fuelled energy sector.

Main policy responses to key environmental challenges and concerns

In the period 2007–2011, over 85% of all waste was generated by the industrial sector, with 79% of total waste comprising waste from the oil-shale industry and energy sector (including hazardous waste) (Figure 2)[8]. However, the oil-shale industry is seeking ways to recover and reduce waste. The wood and cement industries also generate large volumes of waste, but most of that is recovered.

Figure 2. Generation and recovery of waste, 2000-2012



Source: Estonian Environment Agency, Waste Data Management System [8]

While 20% of total waste was recovered in 2005, in the following five years the recovery rate was 33%. In 2011, waste recovery reached 55%, which was mostly a result of the increased recovery of oil-shale mining waste. In that year, the semi-coke landfills were closed and pitch lakes containing the waste from oil production were filled with mine waste (e.g. crushed limestone). Besides, in 2011 several large-scale road construction projects were launched in which mine waste was used as an embankment filling material.

The pollution charge for depositing oil-shale mining waste and waste from mineral dressing is on the increase.

Therefore, for the past five years, there has been a greater focus on increasing the share of recovered waste. As a result of this focus, several powerful stone-crushing plants have been established. About 90% of the mine waste generated by companies was recovered in 2011 and 2012, which accounted for 70% of all recycled waste.

The main sources of ambient air pollution are transport, the combustion of oil shale for energy, and wood combustion in the residential sector. Air pollution policy has increasingly focused on particulates and their fractions. The exceedance of limit values for PM_{10} has regularly been registered in the centre of Tallinn city[9], although a significant decrease has been observed in concentrations in recent years.

The majority of Estonia's coastal waters are in moderate status. Haapsalu Bay is an exception: it's ecological status is considered to be poor[10]. Although Haapsalu's modern wastewater treatment facility was completed in 1998, pollution accumulated in bottom sediments still has an effect due to the shallowness of the bay and poor water exchange. The conditions of Lake Peipsi are deteriorating and it is classified as being of moderate status[11]. In general, approximately 34% of monitored water bodies are considered as being in moderate status or worse[12]. Therefore, during the next Water Management Plan period (2016-2021), the application of water-protection measures should be enforced.

Estonia has had good success lately in building modern wastewater treatment plants and in modernising industry so as to diminish pollution. However, the country still has to clean land and sediments contaminated with hazardous substances and fertilisers, as well as deal with the impact of historical drainage systems.

Country specific issues

Estonia has great potential for sustainable tourism in nature i.e. eco-tourism. People have started to make more sustainable choices, and spending time in nature is growing in popularity. Nature tourism is organised by the State Forest Management Centre (RMK). Besides managing state forests, RMK offers active leisure opportunities by managing a national forest recreation infrastructure that includes 13 recreational core areas and a total of 2 000 km of nature trails[13].

Forward-looking scenarios envision Estonia as a country that is based on sustainable agriculture and forestry[1]. Pollinators, whose numbers have been depleted by intensive farming and the use of pesticides, are among the chief beneficiaries of organic farming.

> Estonia's status as a small, highly urbanised, and very sparsely populated country – but one which still has remarkably untouched nature – is a good basis for a sustainable, ecosystem-based economy in balance with nature.

Countries and regions

Finland

Main themes and sectors addressed in the national State of Environment report

'State of the Environment in Finland 2013'[1] is a general report covering broad environment issues. It has eight main topics:

- natural resources,
- climate change and energy,
- communities and transport,
- air pollutants,
- fresh water and the sea,
- biodiversity,
- chemicals and hazardous substances,
- and green economy.

In parallel with this national report, the 13 regional Centres for Economic Development, Transport and the Environment (ELY Centres) have published their own regional environment reviews.

Nearly every indicator in the report includes an assessment of both the long-term and the short-term trend as well as of the situation in relation to the targets.

The report is a response to the requirement of the EU Directive on Public Access to Environmental Information. Data sources included environmental administration, several other authorities and research institutes.

Key findings of the State of Environment report

Many of the indicators show an improvement in the state of the environment. Air and water pollution have clearly declined over recent decades. Trends earlier seen as irreversible, e.g. increases in private car use and energy consumption, are showing signs of leveling off.

However, serious problems like climate change and biodiversity loss remain unresolved. Despite deadlines aiming to halt the decline of biodiversity, the target has not been reached. Approximately one tenth of Finnish species were classified as threatened in 2010. More than one third of these are forest species. Nature reserves and wilderness areas cover some 9% of Finland's surface area, which is close to the international average.

Over the last hundred years, the average temperature has increased by approximately one degree in Finland. Warming has been most intense in spring time.

Emissions are decreasing, mainly as a consequence of advances in fuel technology and improvements in industrial processes and treatment technologies. A considerable share of Finland's economic growth in recent decades has been based on natural resources from overseas which explains the reduction in local impacts.

Due to better control, the sulphur and nitrogen oxide emissions have declined by almost one half and by more than three quarters since 1990, respectively. Measures taken to reduce ammonia emissions have not been as effective. Emissions of compounds which form ozone in the troposphere have declined since 1990 but particle pollution has not declined. In general, days with poor air quality are rare in Finland.

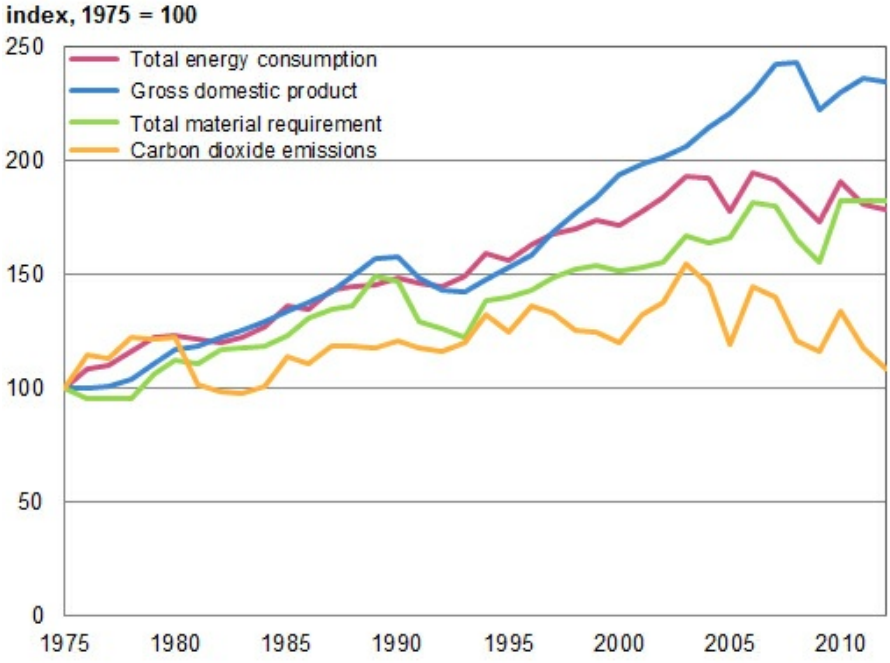
Traffic volumes have increased but most traffic-related emissions have clearly fallen since the early 1980s with the exception of carbon dioxide emissions which continued to grow until 2005. One factor slowing the decrease in emissions is that Finns are commuting longer distances: the average distance from home to work has increased by about 20% between 2000 and 2010 and doubled since 1985.

Discharges from industry and communities have reduced sharply since 1980 but rivers still carry high quantities of nutrients. In addition, since the 1990s, the nutrient balance of cropland has declined in Finland, with the phosphorus balance in particular falling by up to one quarter from 1996 to 2011.

The ecological status of lakes and rivers in Northern Finland, and big lakes throughout the country, is mainly good or high. Many small lakes in Southern Finland suffer from eutrophication. High nutrient concentrations are also degrading the status of rivers. On the coast, the status of the Archipelago Sea and the Gulf of Finland is alarming. However, the status of the easternmost part of the Gulf of Finland has improved in recent years, thanks to water protection measures and more efficient wastewater treatment in St. Petersburg in particular.

In recent years the use of natural resources has been reduced by producing goods and services using smaller amounts of resources with lower emissions. These increases in eco-efficiency have been most pronounced since the mid-1990s (Figure 1).

Figure 1. Trends in gross domestic product, total energy consumption, carbon dioxide emissions and total material requirement, 1975–2012



Source: Statistics Finland. 2013.

Main policy responses to key environmental challenges and concerns

The key objectives of the 'National Energy and Climate Strategy'[2] include ensuring that the national targets for 2020 are achieved and preparing a pathway towards meeting the long-term energy and climate objectives set by the EU. The new strategy entails a programme to reduce oil dependence. The long-term goal is a carbon-neutral society: the roadmap towards 2050 involves better energy-efficiency and the use of renewable energy.

The Strategy for the Conservation and Sustainable Use of Biodiversity in Finland for the period 2012–2020[3] has as the main goal to halt biodiversity loss in Finland by 2020. It strongly emphasizes economic and cultural values related to biodiversity in decision-making concerning the use of natural resources. The strategy's five objectives focus on the mainstreaming of environmental issues across society, the introduction of new participants in the work to advance environmental causes, a decision-making process based on robust research data, and Finland's responsibility for the global environment. Particular attention is paid to sustainable use of natural resources. The Strategy is accompanied by an Action Plan[4].

The revised Programme to Promote Sustainable Consumption and Production, 'More from Less – Wisely'[5] aims to reduce the environmental impacts and greenhouse gas emissions of households and the public sector. It proposes that the state and municipalities set an example by creating the preconditions for more-sustainable solutions. The programme promotes energy smart and comfortable living, high-quality food without waste, and smooth and environmentally friendly transport. In June 2013 the Government gave a resolution[6] on the basis of the programme, and also a resolution[7] about promoting sustainable environmental and energy solutions (Cleantech) in the administration.

A 'Strategy for sustainable development'[8] was published in 2006. It has been assessed since then and in 2012 the process resulted in a commitment: 'The Finland we want by 2050 — Society's commitment to sustainable development'[9]. The main objectives of the commitment are equal prospects for well-being, a participatory society for citizens, sustainable work, sustainable local communities, a carbon-neutral society, and an economy that is resource-wise.

The Finnish Government's resolution 'Programme for Implementation of River Basin Management Plans 2010–2015'[10] in 2011 followed the approval of all the seven river basin management plans (RBMPs) in 2009. The aim is to improve considerably the ecological status of the waters. The Implementation Programme is based on the RBMPs and defines the national level priorities amongst the measures.

Finland's Marine Strategy[11] reflects the importance of a good status of the Baltic Sea. The first phase of the marine strategy was addressed in a Government resolution[12] in 2012. There are now five marine programmes and action plans[13],[14].

The Environmental Protection Act[15] includes air quality. The Air Quality Programme 2010[16] is the National Programme for the implementation of Directive 2001/81/EU on national ceilings for certain atmospheric pollutants. The Programme defines the measures to reduce emissions e.g. from energy production, transport, agriculture, and industry.

The existing Programmes and strategies[17] related to land use and building address several environmental issues like energy efficiency, the transparency of land use planning, biodiversity and scenic values, ecosystem services and sustainable natural resources, cultural environment, environmental noise levels and traffic systems.

Country specific issues

The main issue in Finnish environmental policy in the next few decades will be the concept of carbon-neutrality. The goal of the Finnish government is an 80–95 % reduction in greenhouse gas emissions by 2050. This means eliminating more or less all emissions from the energy consumption. An Energy and Climate roadmap 2050[18] to determine actions needed to meet this goal is under preparation.

At the same time, a number of municipalities in Finland are seeking for a faster timetable for achieving carbon-neutrality. Currently 19 municipalities have joined the Carbon Neutral Municipalities project[19], and made a commitment to an 80% emission reduction by 2030.

A key question, when targeting carbon-neutrality, will be how to prevent the loss of biodiversity when the pressure on utilizing the country's forests and other renewable natural resources is expected to increase.

In addition, topics like ecosystem services, green economy, resource efficiency, water quality, and urban environment will be essential also in the future.

Countries and regions

France

Main themes and sectors addressed in the national State of Environment report

> France publishes a report on the state of the environment every four years. The report aims to inform the general public as to the situation of the different parts of the environment in France and to explain the pressures acting on these parts. The report is not intended to assess public policy or the actions resulting from public policy. The last edition of the report was published in December 2014.[1]

Since 1994, **the amount of information available on the environment has increased and has become widely accessible** to different stakeholders and members of the public. Given the abundance of information, and the fact that this information comes from multiple sources, **the challenge is now to help the public to better understand the mechanisms at work in the environment**.

The 2014 report therefore provides a synoptic view of **different elements of the environment** such as biodiversity, pressures on natural resources, and exposure to hazards and nuisances. It then addresses **societal responses** to meet environmental challenges such as the decline in biodiversity, depletion of resources, or vulnerability of sub-national territories. These responses include changes in lifestyles and patterns of consumption, the greening of economic activities, and the reduction of environmental inequalities.

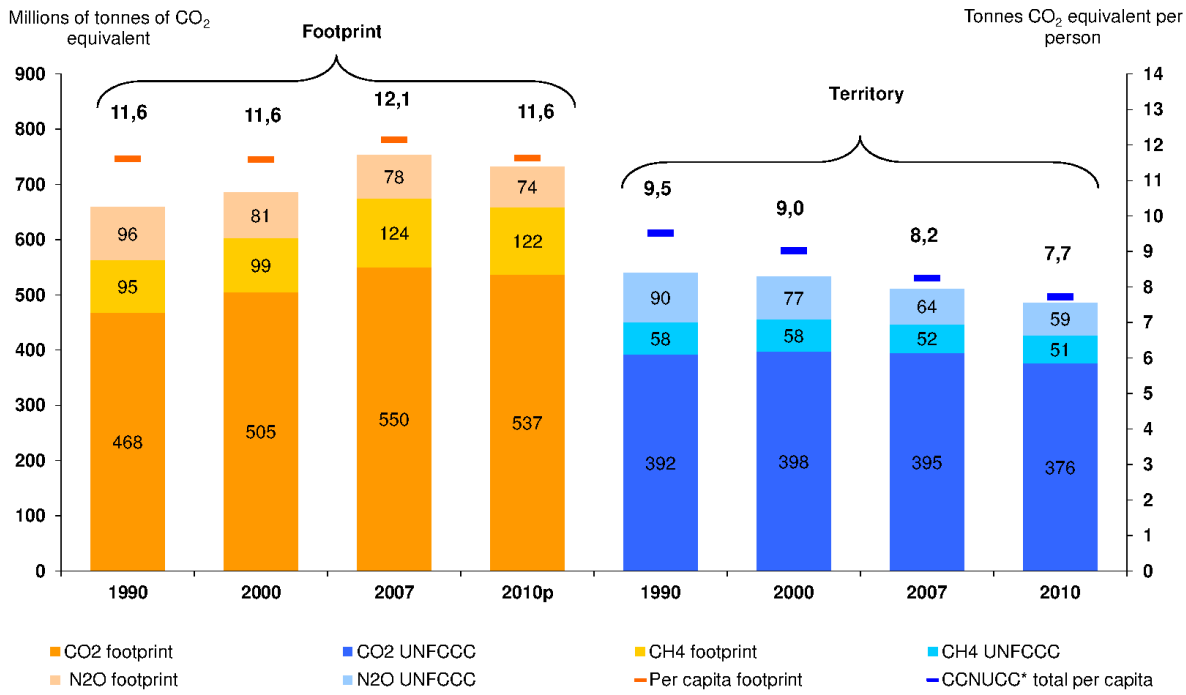
Key findings of the State of Environment report

Since the 1990s, the French economy has increasingly turned towards service activities rather than industrial ones. As a result, emissions of some pollutants – and consumption of natural resources within French territory – have decreased accordingly. The global economic crisis since 2008 has amplified this trend. **The transfer of some industrial activities to other countries has led to an externalisation of certain environmental pressures**: greenhouse gas emissions (Figure 1), consumption of natural resources, etc.

Since the 1990s, coastal areas and major urban agglomerations have experienced an **increase in the construction of housing and other infrastructure** development due to their attractiveness as a living environment. This growth of urban areas has created a **corresponding need for mobility**. At the end of 2012, urbanised areas (areas containing housing, transport infrastructure, etc.) accounted for 9.1% of French territory.

From 1990 to 2012, **France reduced its greenhouse gas emissions by 13%**. However, emissions from the transport sector (the sector with the greatest emissions) have not fallen in this time. **Pollution from industrial facilities and urban-wastewater treatment plants has been reduced, but pollution from diffuse sources such as agriculture or transport has not fallen**. Thus, phosphate levels in rivers have fallen by almost half since 1998, due to better urban-wastewater treatment and less use of phosphate-containing fertilisers. However, nitrate levels in rivers remain stable and are increasing in groundwater bodies.

Figure 1. Comparison of evolution of carbon footprints and emissions from national territory[2]

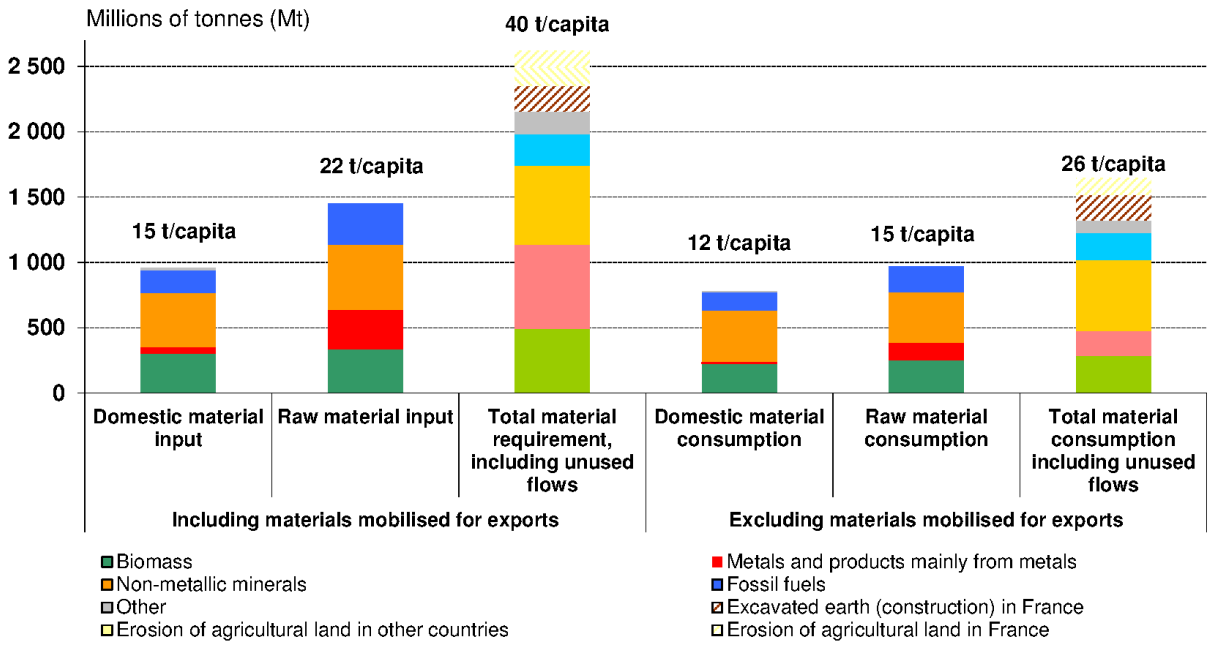


Note : * United Nations Framework Convention on Climate Change (Kyoto Protocol). 2013 version of GHG inventory for UNFCCC.
Source : IEA, Citepa, Customs, Eurostat, Insee, SOeS calculations.

While **air quality has improved** on average by 20% from 1990 to 2012 (largely as a result of a decrease in sulphur dioxide emissions) the threshold levels for protection of public health for certain pollutants (ozone, fine particulates, and nitrogen dioxide) were exceeded at one measurement station in ten in 2012. **Soils are subject to severe pressures**, and are being degraded by erosion, sealing and pollution.

To meet its needs, France calls heavily on natural resources, both from its own territory and in other countries. Since 1990, annual per-capita domestic material consumption has remained close to 14 tonnes, despite improved material productivity and the development of the repair industry. In fact, **improvements in resource-efficiency achieved in manufacturing processes are offset by increasing demand**. Taking account of unused domestic extraction (e.g. displaced materials, crop residues) and flows related to foreign trade, total per-capita consumption reaches 26 tonnes (Figure 2). **Waste generation is slow to reduce**, and has stayed at around 5.5 tonnes per inhabitant in 2010 (mostly waste from construction, building and public works). The quantities of municipal waste collected per inhabitant every year have increased by 25% since 1996, reaching 600 kg in 2011. On the positive side, the annual amount of household waste from which value is recovered (either by recycling or by using waste for biomass) has grown by 60% in the past ten years.

Figure 2 : Apparent material input and consumption, and hidden flows of materials mobilised by the French economy, 2010[3]



Note for readers: for flows given as RME, the weights correspond to categories indicated (biomass, metals, etc.); for total mobilisation of materials (light colours), each of these categories covers the apparent flow plus all of the associated hidden flows, including materials of different types mobilised in the different economic stages (e.g. fuels associated with production of imported biomass).

Source: Agreste (SSP), Bio Intelligence Service, French Customs and Excise, Eurostat, Insee, Unicem, Solagro, SOeS, Wuppertal Institut. Modified SOeS, 2013

Environmental contamination, destruction of natural areas, proliferation of invasive species and over-exploitation of resources all contribute to the **decline in biodiversity**. For instance, the numbers of specialist farmland birds have decreased by 35% since 1990.

Main policy responses to key environmental challenges and concerns

Numerous steps have been taken to restore the natural environment and to maintain ecosystems. The network of **sites protected under Natura 2000** covered 12.6% of national territory in 2013, representing around 69 000 km².

The proportion of **protected marine areas** in the waters under French jurisdiction went from 0.1% in 1980 to 2.4% in 2012.

These actions, together with measures targeting species protection, have contributed to an **improvement of the situation of some species previously threatened with disappearance** (wolves, otters, beavers, etc.).

Beyond the implementation of European environmental policies, France is attempting to bring about **change in consumption and production patterns** and to **reduce environmental inequalities**.

Many national and territorial action plans are being implemented to **reduce emissions of pollutants** (pesticides, nitrates, etc.) into the water: the Ecophyto action plan[4] and the introduction of nitrate vulnerable zones[5] are leading to changes in agricultural practices. In 2012, organic farming accounted for 3.8% of the total agricultural area. In addition, wastewater treatment plants are being upgraded.

The implementation of regional plans to protect the atmosphere [6] in large cities has helped to **improve air quality**.

Other **changes in habits and practices are already perceptible**. These include greater sales of appliances that help to conserve resources and energy; increased sales of lower-emission vehicles; greater development of public transport; and increased use of renewable energy. All of these changes are leading to a reduction in certain emissions of pollutants, better material and energy productivity and a reduction in waste generation.

The public authorities are also moving to **support the development of new environmentally-friendly businesses**. Their actions have led to support for R&D, eco-innovation, and other strategic sectors. The promotion of environmental training is another lever for action that is contributing to more rapid integration of environmental concerns into the economy. Since 2004, the number of environment-related jobs has increased by 36%. In 2012 there were 447 500 such jobs, mainly in the areas of water, waste management and renewable energy. The numbers of students taking environment-related courses is constantly increasing.

The French government is also seeking to **reduce environmental inequalities**. Remedial measures are being implemented in a variety of sectors (management of contaminated sites and soils, preservation of water resources intended for human consumption, noise abatement, and prevention of air pollution).

Actions are also being developed by regional and local governments in areas such as adaptation to climate change, the prevention of natural and technological hazards, and the creation of "green" and "blue" conservation corridors. France's urban planning law promotes the sustainable development of sub-national territories in order to reconcile territorial development, environmental preservation and reductions in exposure to hazards and nuisances. "Green" city areas are also being developed along with dedicated-right-of-way transport infrastructure (notably for trams).

Country specific issues

The 2000s have seen the development of several tools to promote understanding of the French environment. Relevant and appropriate information is emerging such as the idea of the **environmental footprint**, which provides a clear illustration of pressures on the environment. For decision makers, research work into areas such as environmental health, unpaid ecological costs, and the evaluation of ecosystem services will provide support for the decision-making process.

France's population and territory are **highly exposed to natural and technological hazards, with some risks being exacerbated by climate change**. Another issue is the exposure of the French population to nuisances such as chemicals present in the environment, electromagnetic waves, radioactivity, and noise, all of which could affect health.

Lastly, in a context of national and international mobilisation around environmental issues (climate change, exposure to hazards, etc.), **environmental awareness among French people has increased**. This is the case even though economic issues – always preponderant in a time of economic crisis – tend to be uppermost in their individual concerns.

Countries and regions

Germany

The state of the environment in Germany has improved markedly since 1990. Nevertheless, considerable further efforts are needed. Pritorities in environmental policies are set on climate protection, sustainable use of energy and resources, a further reduction of substance inputs to the environment and promoting the transition to a green economy.

Main themes and sectors addressed in the national State of Environment report

State of the Environment reporting in Germany takes place at various levels.

The Federal Government reports to the Bundestag on the state of the environment according to the Environmental Information Act[1]. The most recent edition was presented in 2010[2], the next edition is planned for the first half of 2015.

The Environment Report 2010 provides an overview of the environmental situation in Germany and internationally as well as of the resulting challenges. It takes stock of German environmental policy from 2006 to 2010 and provides a comprehensive synopsis of the Federal Government's activities during this period at both national and international level. It also presents prospects for future action through goals and planned measures.

Detailed data are not included in the Environment Report 2010. To this end, the responsible agencies provide comprehensive, regularly updated overviews. Information on the state of the environment is provided by the Federal Environment Agency, with its "Data on the Environment[3]" (continually kept up-to-date on the Agency's website). The data compare the state of environmental assets and resources with the use of the environment by economic sectors and human activities. Environmentally induced risks to human health are also an important topic.

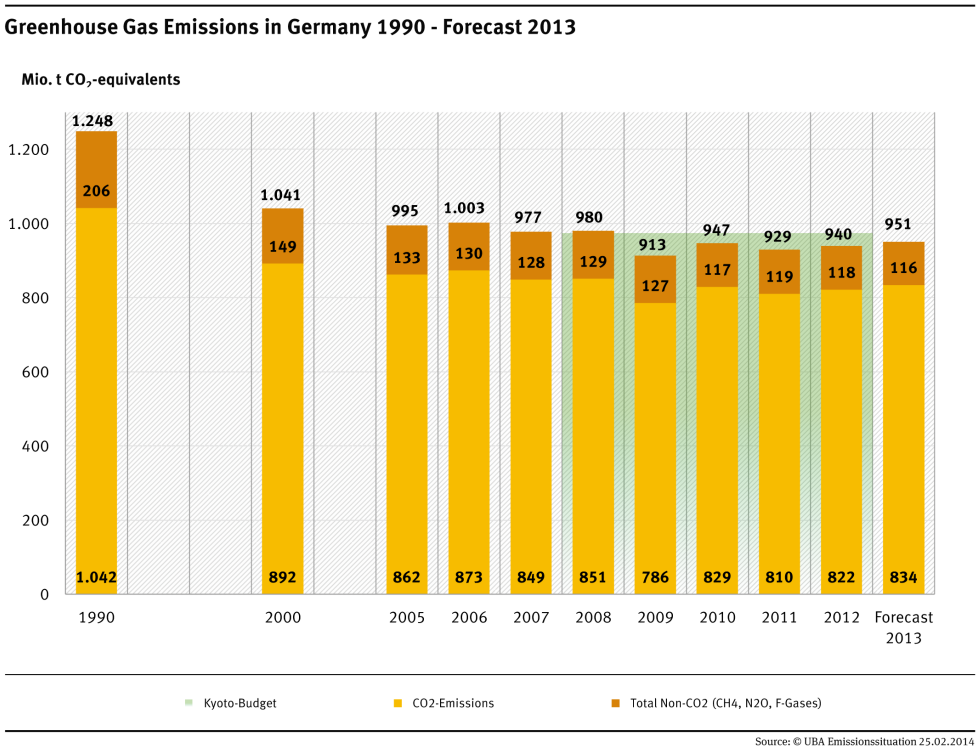
The Federal Nature Conservation Agency's "Data on Nature" reports[4] (most recent edition from 2012) describe the state and use of the natural environment through data and information on population numbers and threats to plant and animal species, biotope types and landscapes, and uses of land and resources relevant to nature conservation. Another part is devoted to nature conservation instruments and measures.

Key findings of the State of Environment report

The state of the environment in Germany has improved markedly since reunification, particularly in eastern Germany. Nevertheless, considerable further efforts are required to achieve the Federal Government's goals on time. Action is required in particular in climate protection, in further reducing substance inputs to the environment, and in sustainable energy and resource use.

Emissions of greenhouse gases fell by 23.8% between 1990 and 2013[5].

Figure 1: Greenhouse gas emissions in Germany, 1990 - forecast 2013



Emissions of eutrophying and acidifying air pollutants and of ozone precursors decreased to 60% of their 1990 level by 2012 (mean value of the emissions of SO_2, NO_x, NH_3 and NMVOC).

Nevertheless, **concentrations** of NO_2, PM_{10} and O_3 remain too high. All three are seeing exceedances of the current limit and target values for protection of human health[6].

Although **pollution of watercourses** has decreased, more needs to be done with regard to some persistant pollutants, heavy metals, pesticides and medicinal products. The goal set by the European Union – a good or high ecological status in all watercourses by 2015 – is met by 8% of watercourses in Germany[7].

There is an urgent need from an environmental perspective to limit the growth in **areas for settlement and transport purposes**, especially around conurbations. At the end of 2012, they accounted for 13.5% of Germany's total area. Daily consumption of new land for settlement and transport amounted to about 69 hectares in 2012 and 74 hectares averaged over the four years from 2009 to 2012.

One of the goals of the Federal Government's Sustainable Development Strategy is to improve **resource efficiency** without any losses in prosperity while at the same time reducing the use of raw materials. Raw materials productivity in 2020 is to be double its level in 1994. By 2012 it had risen to 149%. While GDP grew by 28% between 1994 and 2012, the use of raw materials including imports fell by 14%[8].

Energy productivity is considered an indicator of an efficient use of primary energy. The aim is for energy productivity to double by 2020 compared to 1990. It had risen to 145% by 2013, thanks to an increase in GDP to 136 % and a simultaneous decline in primary energy consumption to 93%[9].

In 2013, the share of **renewable energy** sources in final energy consumption was 12.0%. Renewable energy sources accounted for 25.3% of gross electricity consumption, 9.1% of heat provision and 5.5% of fuel consumption. As a result, about 146 million tonnes of CO_2 equivalent greenhouse gas emissions were avoided[10][11].

Main policy responses to key environmental challenges and concerns

As provided for in the agreement[12] of the coalition government elected in autumn 2013, an integrated, long-term environment programme is currently being developed, which sets out a vision for and goals and priorities for environment policy.

Climate protection plays a central role in environment and energy policy. The Federal Government aims to reduce greenhouse gas emissions by at least 40% by 2020, compared to 1990 levels[15]. Current projections expect that, with an average annual economic growth of 1.4%, a reduction of greenhouse gases by 33% can be achieved until 2020 as a result of the measures resolved and already implemented. Thus, additional measures are required to achieve the 40%-goal – two of the key sectors in this context are energy-saving building renovation and sustainable mobility. The necessary steps have been defined in the national "Climate Action Programme 2020"[13].

Using energy efficiently is an important element of climate protection and one of the key elements of Germany's "Energiewende". This includes energy saving, improving energy efficiency, and expanding renewable energies while maintaining competitive energy prices and a high level of prosperity. The Federal Government has set itself the goal of reducing primary energy consumption by 20% by 2020 and 50% by 2050 compared to 2008. It aims to reduce electricity consumption by 10% by 2020 and 25% by 2050. Final energy productivity is to grow on average by 2.1% annually until 2050. The share of renewables in the electricity sector is to be increased by 40 to 45% by 2025 and by 55 to 60% by 2035.

Even if the rise in the global average temperature can be limited to 2°C compared to pre-industrial levels, there will be consequences of climate change to deal with. The Federal government adopted the German Strategy for Adaptation to Climate Change[14] in December 2008. The aim of the strategy is to reduce vulnerability to the consequences of climate change, i.e. to maintain or improve the adaptability of natural, social and economic systems.

However, there are further challenges and megatrends which must be responded to by an integrated environment policy.

Reducing the consumption of materials and raw materials is one of the central challenges of a sustainable society in the 21st century.

The goal of the **German Resource Efficiency Programme** (ProgRess)[16] is to make the extraction and use of natural resources more sustainable and to reduce associated environmental pollution as far as possible. The programme attaches particular importance to market incentives, information, expert advice, education, research and innovation and to strengthening voluntary measures and initiatives by industry and society. The resource efficiency policy will help Germany meet its global responsibility for the ecological and social impacts of resource use. The goal is to reduce the use of resource in absolute terms.

A closed-cycle **waste** management makes a key contribution to this. At the heart of waste management policy in Germany is product responsibility. Producers and distributors must design their products in such a way as to reduce waste generation and allow environmentally sound reuse of waste as raw material or as an energy source both in the production of the goods and in their subsequent use. Ambitious recycling quotas, competition, and product responsibility will be strengthened.

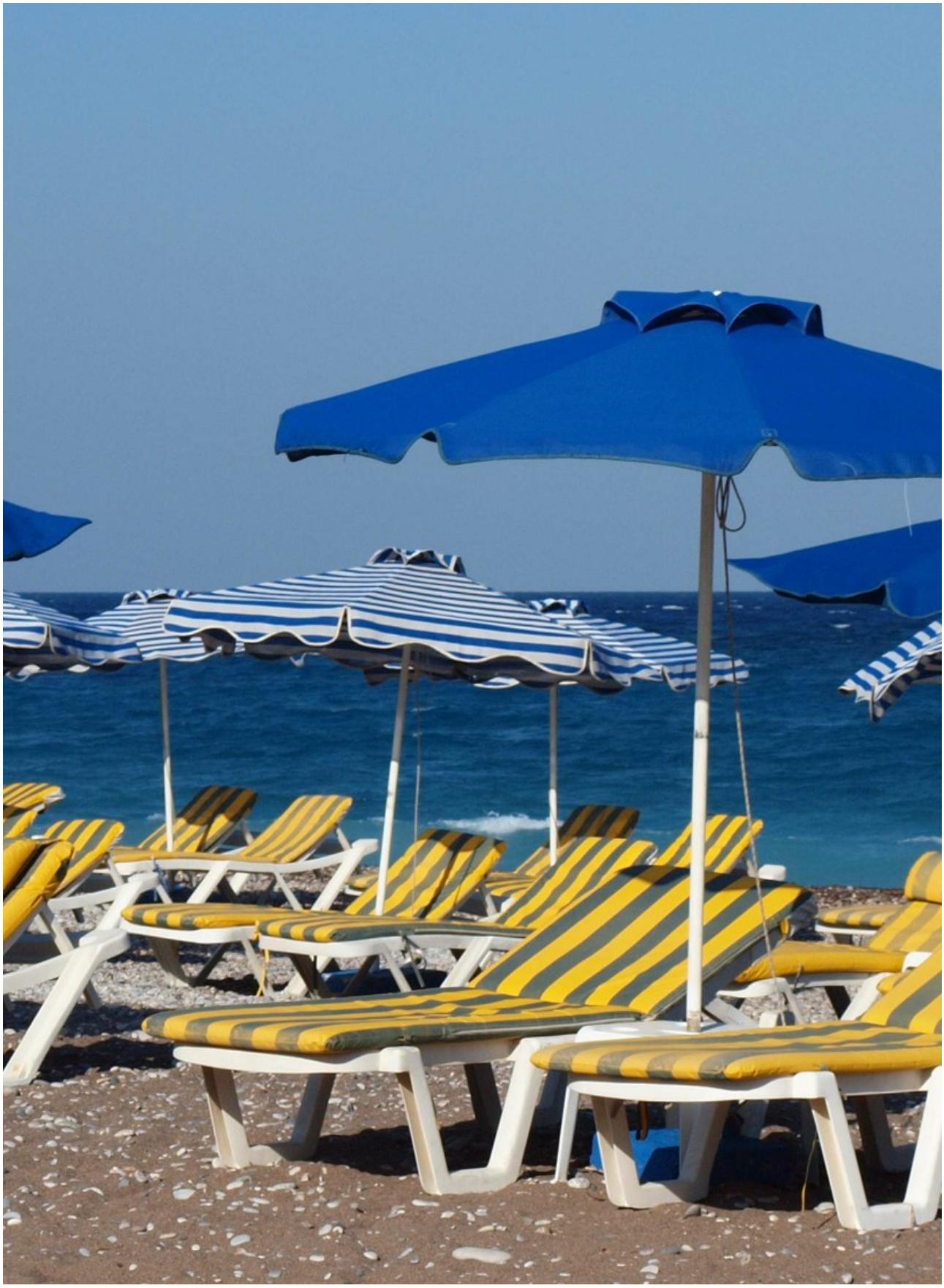
Land take by settlements and transport infrastructure is to be limited to not more than 30 hectares a day by 2020.

Country specific issues

Environmental protection has developed into an important factor in the German economy.

In 2011, Germany produced potential environmental protection products to the value of almost EUR 85 billion. This corresponds to 6.2% of total industrial production. Products which can be used for climate protection purposes accounted for well over 40% of the total production of potential environmental protection products. Since all forecasts are pointing to worldwide expansion of the markets in the years ahead, the economic importance of the environmental sector will continue to grow. German companies continue to lead the environmental goods market at international level. With a 15.2% share of world trade in 2011, Germany again led the world in exports of environmental goods. It was followed by China with a share of 14.5% of world trade and the US with 10.8%[17].

Although German suppliers have been able to successfully utilize their technological advantage on foreign markets, Germany's relative export/import position in potential environmental protection goods has weakened somewhat since the mid-2000s[18]. This is due above all to a sharp increase in competition from imports of climate protection goods (mainly solar energy, but also wind power).



Countries and regions

Greece

Main themes and sectors addressed in the national State of Environment report

The national state of the environment report (SoER) for the period 2008-2011 was published in 2014 by the National Centre for Sustainable Development (NCSD)[1]. The previous SoER was published in July 2009. The SoER addresses the following main areas:

- air quality,
- water resources management,
- nature and biodiversity,
- urban environment,
- transport sector,
- environment and economy, and
- environmental legislation.

Key findings of the State of Environment report

Air quality

The study showed that in 2009 there was a 7.3% decrease in the total sum of emissions from acidifying substances (SO_2, NO_x, and NH_3) and a 10.3% decrease in tropospheric ozone precursors (NO_x, NMVOC, CO and CH_4) compared with 1990. There was an increase of 51.5% in primary PM_{10} emissions during the same period.

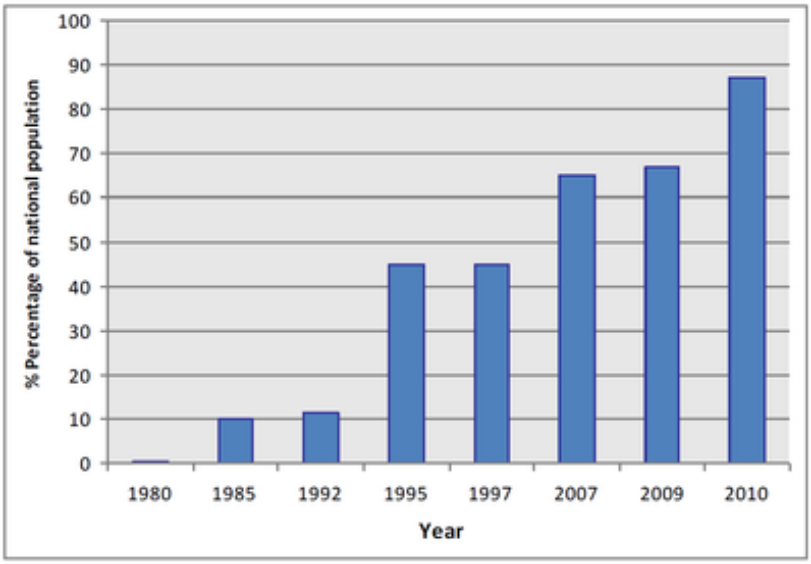
The most important sectors of emissions in 2009 included industrial energy (due to combustion), transport, while agriculture had the largest contribution to NH_3 emissions. Industrial construction and services, and households were estimated to be the most significant sectors for the emissions of primary PM_{10} and $PM_{2.5}$, respectively.

Water resources

Increasing demand for water and groundwater abstraction tend to raise the water deficit in many regions. Water needs are often covered by transmission and storage projects, which greatly increase the cost of construction and operation. Human activities lead to a gradual degradation of the qualitative status of surface and groundwater resources, mainly in coastal and urban or agricultural areas on the eastern part of the mainland.

Wastewater treatment plants operate in most large and medium-sized cities and deal with municipal wastewater pollution. Figure 1 shows the increase in the percentage of the national population served by wastewater treatment plants. The rate in 1980 was 0.5%, in 2007 was 65%, and 87.32% in 2010.

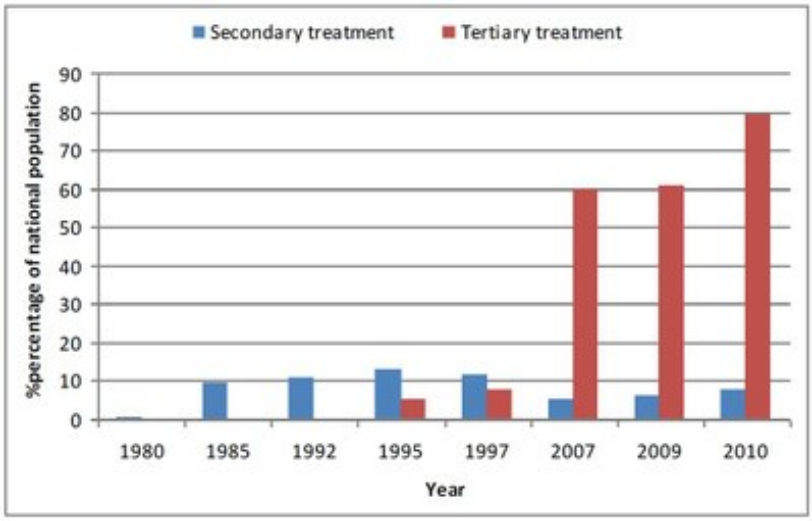
Figure 1: Share of the national population served by wastewater treatment plants



Source: Special Secretariat for Water, OECD

Figure 2 shows the time evolution of the percentage of the national population served by wastewater treatment plants (secondary and tertiary treatment). Since 2007 a significant increase in tertiary treatment occurred.

Figure 2: Share of the national population served by secondary and tertiary wastewater treatment plants



Source: Special Secretariat for Water, OECD

Nature and Biodiversity

Greece is considered as a "hot spot" for biodiversity, with more than 6 200 endemic species[2][3].

There has been a downward trend in the Red List Index (RLI) for Greek bird species during the last 17 years. This indicates that the number of bird species facing extinction is increasing. This trend is mainly associated with the loss of natural habitats, their structural and functional degradation, pollution and disturbance.

Approximately half the area of Greece used for agricultural purposes has a High Nature Value (HNV). Total agricultural and forest land covers 51% of the total area, of which 18% are forests, 15% is forest land used for grazing and 18% is cultivated land.

The main causes of loss of biodiversity in Greece are related to past and current policies relating to land use, agriculture, fisheries, forest use, transport, tourism and production and consumption patterns.

Urban Environment

The agglomerations of Athens and Thessaloniki account for nearly 50% of the country's population. There has been an increase in traffic in Thessaloniki and there is an urgent need for building large transport infrastructure projects.

In general, urban areas are growing, while forests and farmland are falling. There is an effort to promote more environmentally friendly ways of transport. The cities with the highest air pollution problems and traffic noise are Athens and Thessaloniki. The metropolitan area of Attica presents the biggest problem in waste management domain. It has 35 uncontrolled waste disposal sites. The air pollution and the lack of ventilation in Athens enhance the urban heat island effect, which increases during the summer.

Environment and tourism

The **tourism industry** has experienced increased growth. However, while the number of arrivals of foreign tourists presents a long-term upward trend, income from tourism has been falling as a result of the growth in mass tourism. Such tourism has also a significant impact on the environment thereby undermining long-term development.

The most sensitive areas are the coastal areas. The most visible effects of environmental degradation are the coastal roads leading to tourist destinations, and overcrowding on beaches. The excessive consumption of water during the drought period represents a pressure on water resources, particularly in the islands. Overpumping due to the high demand for water has multiple impacts in these areas, such as irreversible salinization of groundwater aquifers. The tourism industry is also a producer of large quantities of solid waste. Local authorities in most cases have difficulties in coping effectively with this waste production.

Environment and Economy

Following a decade (1997-2007) of high rates of economic development (4% GDP annual growth rate, 3.8% annual productivity growth rate), the Greek economy was struck by the major international financial crisis in 2008. The government's fiscal deficit almost doubled from -6.3% to -13.2% of GDP, while external public debt exceeded 123% of GDP with an increasing trend (161% in 2012).

In order to confront the crisis, reactivate production processes, and provide a stimulus impulse to the internal markets, the government implemented a program of emergency measures. A new growth model for the Greek economy was deemed necessary. Government policies during the 2008-2012 period included various actions:

- Establishment of the Ministry of Environment, Energy and Climate Change (MEEC) in 2009.
- The gradual opening of the internal energy market.
- The unbundling of power production and supply from power transmission and power distribution.
- Further penetration of natural gas usage in transportation, heating, manufacturing and industrial production.
- Establishment of the greenhouse gas (GHG) emissions registry according to EU legislation.
- The implementation of the urban waste management program and a series of measures for the environmental efficiency of buildings and constructions.
- National policies fully aligned to EU policies concerning sustainability, environmental protection and green growth.

Main policy responses to key environmental challenges and concerns

Law 4014 re-determines the **environmental licensing procedures** for projects and activities. In order to implement this, a number of procedures were introduced, which ensured a higher quality of environmental terms, a reduction in administrative burdens, the elimination of dual licensing, the improvement in quality of environmental assessment reports and greater legal certainty.

The **National Waste Management Plan** (NWMP) and the **National Waste Prevention Programme** are currently under preparation. Specific measures include promoting waste recovery and recycling. Regional waste management plans, covering the geographical territory of each region, will be updated incorporating the principles, directions and measures of the NWMP.

For **water** priority has been given to the development and public consultation of River Basin Management Plans (RBMP). Greece has established a national monitoring programme for the assessment of the status of surface water and ground water. The programme monitors biological, general physicochemical, and specific chemical parameters, as well as priority pollutants. The monitoring network includes more than 2000 monitoring points and it has been in operation since 2012.

Since 2010, the Ministry assesses **bathing waters** in accordance with Directive 2006/7/EC, demonstrating a high level of compliance: over 98% had "excellent and good quality" and close to 100% had "at least sufficient quality" out of 2162 bathing waters monitored in 2013.

The main pillars of national **energy** planning are to reduce dependence on imported energy, maximize the penetration of renewables, achieve a significant reduction of GHG emissions by 2050 and reinforce consumer protection. In 2012 the share of renewable sources in the energy market was 15.1% (source Eurostat) compared to 7.1% in 2004.

Country specific issues

Key environmental issues with growing importance for the country are the following:

- **Adaptation to the impacts of climate change**. Climate change represents an emerging environmental problem. The MEEC is working towards the development of a national strategy. Actions to address climate change must involve a change in the current growth model towards a sustainable, green economy and low or zero carbon emissions with the use of modern technology.
- **Management and protection of the natural environment** in conditions of economic crisis. Greece hosts a high diversity of species and ecosystems. Their protection represents a high priority for the Ministry.
- **Management of the marine and coastal environment**, making use of the tools of the Marine Spatial Planning, Integrated Coastal Zone Management, the policy addressing erosion and the EU Strategy for the Adriatic and Ionian Region.

Countries and regions

Hungary

Main themes and sectors addressed in the national State of Environment report

Considering international requirements [1][2], the annual report on the state of the environment (SoER) is stipulated by **Act LIII of 1995** [3]. The SoER[4] is compiled by the government body responsible for the environmental protection (as of 2013 the Ministry of Rural Development, in co-operation with the National Institute for Environment) and aims to inform the Government and the general public.

> The latest report, published in 2013, deals with **environmental topics** such as climate change, diversity of nature, waste management, environmental pollution in connection with health and quality of life, environmental management issues, environmental challenges for Hungary and Europe. The report uses roughly **100 indicators** arranged by the EEA's DPSIR (driving forces–pressures–state–impact–responses) model.

Complementing the SoER, the Hungarian Central Statistical Office publishes environmental snapshots[5] bi-annually and regularly updates national environmental statistics[6] on the internet.

Key findings of the State of Environment report

There has been a decrease in **greenhouse gas** (GHG) emissions from economic activities (since the late 1990s) and from households (since 2006). In 2011, 82% of GHG emissions came directly from economic activity. From 2000 to 2011, N_2O emissions from the economy decreased by 22%, CH_4 emissions by 17%. Meanwhile CO_2 emissions increased until 2005 then started to decrease. An increase in HFC emissions has almost stopped in part because they are replaced by other gas mixtures.

Some of the air pollutants from national economy are still causing environmental problems. Emissions of **acidifying substances** have drastically decreased from 2000 to 2011 (by 65%) primarily due to the use of SO_2 abatement methods. Ammonia and nitrogen-oxide emissions have become the most significant factors of acidification. NO_X concentrations have exceeded health limit values several times over in certain areas.

Emissions of **ozone precursors** decreased from 2000 to 2011 (by 31%); PM_{10} emissions halved while $PM_{2.5}$ fell by one third in the same period. However, the total quantity of atmospheric **particulate matter** is still problematic. Health limit values are often exceeded because the dominant part of total emissions comes from households especially during the winter season and from the effect of long-range transport (PM_{10}: 56%, $PM_{2.5}$: 77%).

The state of **soil**, which is a significant natural resource in Hungary, is good but land used for agriculture is endangered by numerous physical and chemical degradation processes (e.g. erosion, acidification) caused by inadequate land and fertilizer utilization. As the general state of natural areas is a serious issue worldwide, the **loss of biodiversity** also presents a major challenge to Hungary. Biodiversity is considered to be good or over average in some respects but this benefit seems to disappear gradually, e.g. farmland birds' population decreased by about 24% (2007–2012).

Nine per cent of **surface water** courses and 65% of lakes and reservoirs are in good or excellent ecological status (2010).

Since 94% of surface water supply comes from neighbouring countries, it is heavily dependent on external factors, both in quantity and quality. Annual public utility water consumption per capita has gradually decreased since 2000 (by 10%) due to high water price and waste water discharge fee, and, in response, the water supply of private wells. Although the quality of most potable water supplied is good the quality of 30% of public **potable water** supply does not fill EU requirements. This concerns the high concentration of geologically originated arsenic, ammonia, iron and manganese. In 2012, 74% of households were supplied by via the public sewerage system, and 97.8% of **sewage water** was cleaned (46.9% of the total was biologically cleaned, which has been increasing).

Total **waste generation** has slowly been dwindling. In 2007 and 2008, waste generation fell back drastically. In 2010, simultaneously with slight GDP growth, the quantity of waste generated showed a more moderate decrease. The total quantity of waste (2011) still did not reach half the waste generated in 2000. Recycling rate of several waste streams (e.g. municipal solid waste) has increased since 2005. Waste incineration decreased significantly between 2000 and 2005 and has been unchanged ever since. The quantity of deposited municipal solid waste has been decreasing.

Main policy responses to key environmental challenges and concerns

> The National Environment Programme (NEP)[7][8] sets the environmental policy aims and provides the necessary measures, and is complemented by several thematic strategies.

Transportation and **energy** are decisive factors in shaping the state of the atmospheric environment, among others. Funding schemes, legislative changes and pertaining strategies primarily target energy-efficiency (especially for buildings), and increased use of renewable energy. The use of public transport is decreasing, while the rate of private transport is increasing. Funding has been provided for environmentally friendly transport solutions (e.g. public transport, especially city road transport and intercity rail transport, bicycle routes), but there is still room for further improvements.

57 per cent of Hungary's territory is made up of **agricultural land**. National and EU funds have been facilitating agri-environmental measures, however, in 2011, the share of land being used for organic farming (2.2%) is less than half the EU-27 average (5.4%)[9]. For the preservation of **biodiversity**, the NEP ensures priority to the interest of nature in urbanization, infrastructure development and agriculture, and contains active nature conservation measures (e.g. protection of species, remediation of habitats).

The protection of **water resources** is also a principle objective. Improving waste water treatment, modernizing landfills, implementing the nitrate action programme and the new Act CCIX of 2011[10] all contribute to a reduction in adverse effects on waters and the realization of sustainable water management. Basic elements of the Act are principles of protection of natural resources and of recovery of costs, and the 'polluter-pays' principle. The continued improvement of natural water retention, and reservation technologies also play an important role in climate change adaptation. Further hydro-morphological measures are to be made to expand the good ecological status of surface waters.

While there has been a considerable degree of technological development within the economy, the principles of circular economy are not yet widespread. The NEP[8] puts emphasis on further improving **resource efficiency**, strengthening green economy and enhancing eco-innovation. The renewed waste management regulatory system highlights waste prevention, reuse and recycling.

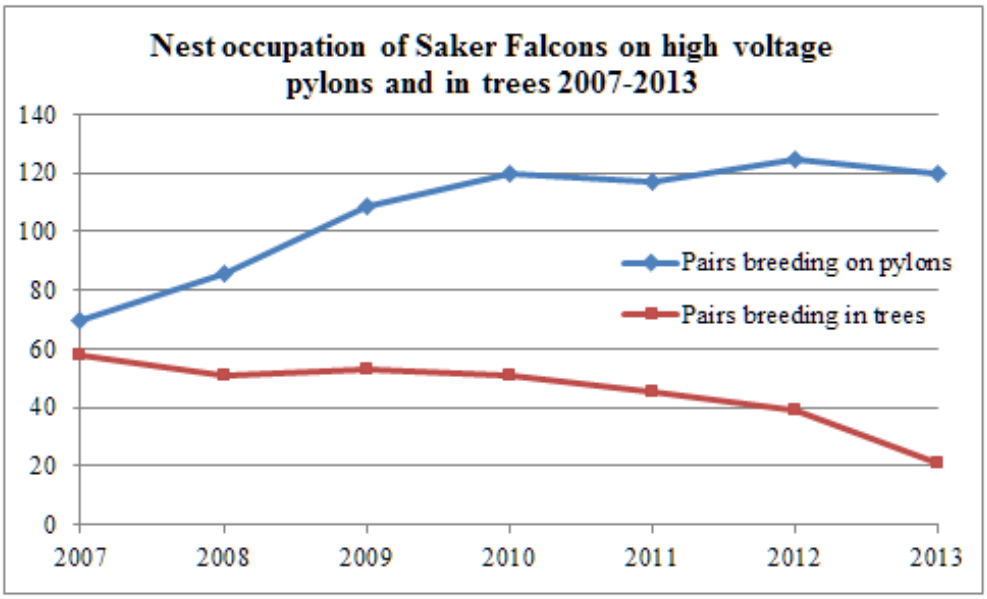
Country specific issues

The Accessible Sky agreement was signed on 26 February 2008 in collaboration with all distribution companies, governmental and non-governmental conservation organisations to minimise bird mortality along power lines. Numerous large-scale projects have been launched since the agreement was signed.[11]

Thanks to improving co-operation, energy companies have also co-financed projects right from the beginning. Since 2011, for the relevant projects, a minimum of 25% co-financing by energy companies is a requirement under the Hungarian Environment and Energy Operational Programme. Under the agreement, Birdlife Hungary produced a conflict map to prioritise all power lines in Hungary. The total length of top priority power lines was 21 700 km for retrofitting.

Large-scale projects included the burial of 80 km and 11 km of medium-voltage power lines in the Hortobágy National Park and in the Borsodi Mezőség Landscape Protection Area, respectively. Bird diverters were fitted on 45 km of medium and high voltage power lines in some of the most important **Great Bustard** sites in Hungary to avoid collision. Two LIFE Nature projects focused on prevention of electrocution: a total of 910 km of medium voltage power lines were insulated to save **Saker Falcons** and **Red-footed Falcons**, primarily. In close cooperation of energy companies and conservation experts, the best available technology (BAT) to produce power lines in a bird friendly way is constantly updated and new solutions are field-tested. In addition, the cooperating partners also support the nesting of Saker Falcons with nestboxes mounted on pylons (Fig 1).

Figure 1: Nest occupation of Saker Falcons on high voltage pylons and in trees



Source: Birdlife Hungary

Dark Sky Parks represent an important role in light pollution reduction movements in Hungary. They draw attention to this growing, but not well-known ecological problem: the sensitivity of wildlife to artificial light at night. In Hungary, there are two certified International Dark Sky Parks. The Starry Sky Park at the **Zselic**[12] Landscape Protection Area became the first certified dark sky park in Europe together with the Scotch Galloway Forest Park in 2009. The second certified area is the **Hortobágy**[13] Starry Sky Park that is located in the heart of the Hortobágy National Park. It earned the International Dark Sky Park title in 2011.

Countries and regions

Iceland

Main themes and sectors addressed in the national State of Environment report

Iceland does not publish a national state of the environment report on a regular basis. However, over the last 20 years, three comprehensive state of the environment reports have been published, the latest in 2009.[1] In addition, the Ministry for the Environment and Natural Resources and Iceland's Environment Agency have recently published several less-comprehensive reports, which shed light on environmental trends in individual sectors.

Taken together, these two types of reports address

- air quality,
- climate change,
- water,
- waste,
- biodiversity,
- sustainable resource use, and
- the links between environment and health.

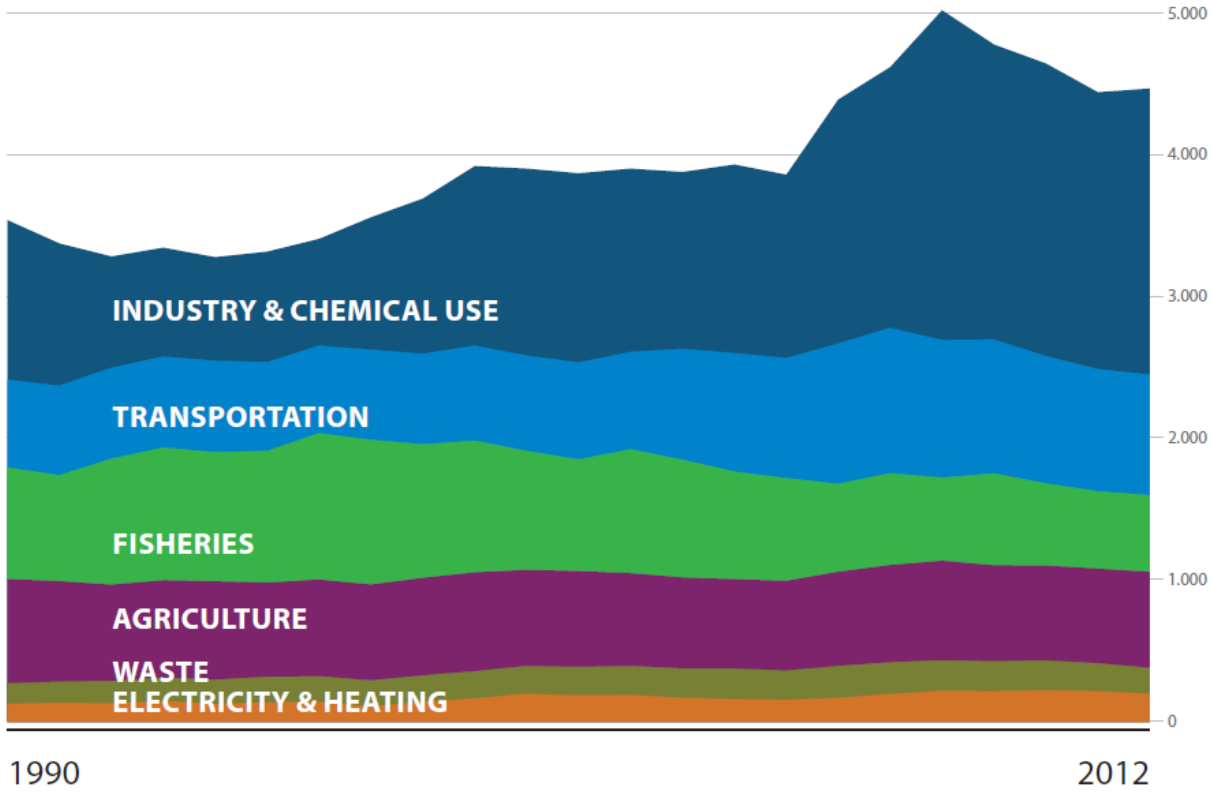
Key findings of the State of Environment report

Climate Change

The rapid retreat of Iceland's glaciers is a very visible effect of climate change. The acidification of the oceans is another equally pressing problem, albeit a less visible one.

From 1990 (the reference year of the Kyoto Protocol) to 2012, Icelandic greenhouse gas emissions increased by 26%[8]. Most of this increase was due to the construction of two new aluminium smelters. In the year 2010 only 18% of Iceland's greenhouse gas emissions came from the waste and energy sectors. It is also noteworthy that emissions over the 20-year (1990-2010) reference period fell by 26% in the fisheries sector and 8% in the agriculture sector. Annual reports have shown Iceland to be on track to meeting its international greenhouse gas reduction commitments for the 2008-2012 period[2]. There are good prospects that Iceland will continue to fulfil its climate commitments for the current commitment period (2013-2020), helped by its participation in the EU's ETS scheme.

Figure 1: Greenhouse gas emissions by category (Thousand of tons - CO_2 equivalent)



Source: Environmental Agency of Iceland, 2014

Healthy and Safe Environment

Air quality in Iceland is generally good, but particulate matter (PM) pollution from road traffic, with sporadic additions from volcanic ash, sometimes exceeds EU limit values, especially during the winter months. Nonetheless, the monitoring values for PM and nitrogen oxide concentrations show a marked downward trend. A new environmental problem in Iceland is the pollution and annoyance in the Reykjavík region caused by hydrogen sulphide from nearby geothermal power plants.[3]

Waste

The management of solid **waste** has improved greatly, and in 2012 69% of all solid waste was recycled or incinerated for energy. Since 1999, all open-pit incineration has been eliminated, and between 2008 and 2012 four waste incinerators that did not meet EU emission standards were closed down.

Water

The 2013 Status Report on Iceland's **water** bodies evaluated the main impacts caused by human activity on water bodies, and whether individual Icelandic water bodies met environmental objectives of good quality.[4]

As of 2010, about 73% of the population is connected to some kind of wastewater treatment. The remaining 27% mainly live in remote coastal villages.[5][1]

Seafood and fishing are important economic sectors in Iceland. Contamination by persistent organic pollutants of seafood from Icelandic waters has continued to fall over the last 10-15 years. Iceland considers this positive development to be the result of international agreements.[1]

Conservation of Icelandic nature and sustainable use of resources

Many areas were put under nature conservation during the period 2008-2012. The most important of these areas is the Vatnajökull National Park, established in 2008. Vatnajökull is Europe's largest national park and includes Europe's largest glacier.[5]

Main policy responses to key environmental challenges and concerns

Iceland's National Strategy for Sustainable Development 2002-2020 has stimulated new policy initiatives on environmental issues of national importance. These issues are further elaborated in a report by the Ministry for the Environment and Natural Resources. These initiatives include:

- A soil conservation strategy for 2003-2014
- The Master Plan for Hydro and Geothermal Energy Resources [6]. This was adopted in 2013 by the Icelandic parliament, and it aims to analyse and identify options for the development of energy resources in Iceland, taking all environmental constraints fully into account.
- A national action plan for the management of solid waste[7]
- A strategy and action plan against climate change until 2050
- A strategy for biological diversity
- A nature conservation strategy for 2009-2013

Two major cargo ships have stranded in Icelandic waters in the past 20 years. One stranding occurred on the south coast in March 1997 and the second occurred on the Reykjanes peninsula on the south west coast in December 2006. Following the second stranding, a governmental committee was established to conduct a hazard assessment of sailing routes for oil tankers and large freight ships in Icelandic waters. The area off the south coast is the most important spawning ground for cod and other important fish species. In spring 2007, the proposal made by the committee was discussed and accepted by the International Maritime Organisation (IMO). As a result, the authorised sailing routes of oil tankers and large freight ships were moved further away from the south-coast shoreline.

Another prominent policy response to environmental concerns is the new carbon tax on fuel (petrol and diesel) as well as tax concessions for the import of 'green' cars (electric, methane and hybrids). Also, a 2010 regulation has now taken full effect for the purpose of lowering hydrogen-sulphide pollution in the Reykjavík area.

Country specific issues

In spite of the fact that "**green energy**" accounts for almost all space heating and electricity (geothermal sources for heat, and hydropower for electricity), Iceland's greenhouse gas footprint (in tonnes of carbon per capita per year) is relatively high compared to other OECD countries. This is mainly because of large emissions from primary metal smelters and the dependence on fossil fuels by the transport and fishery industries. Being a sub-Arctic or semi-Arctic country, with great sensitivity to climate change, climate policies are considered important and are taken seriously. Therefore, Iceland will strive to continue to meet its Kyoto commitments for the current commitment period 2013-2020.

Also, there is continuous debate over the environmental impact of energy projects, which until recently were all considered 'green'. Lately there has been increasing focus and criticism on the externalities associated with geothermal power plants.

Iceland's natural environment is in many ways unique, attracting many tourists every year. However, many areas are vulnerable to intrusion and a constant stream of visitors, and can thus lose their natural value in a relatively short period of time. The value of wilderness areas on the planet is increasing fast in line with increased population and industrial growth. Increasing debate and controversy over both hydro-electric projects and geothermal developments have bolstered the scope for alternative energy solutions such as wind power and tidal energy. There is also increasing focus on electric cars as a way to reduce the country's environmental footprint. Green electricity and relatively short commuting distances should bode well for such a major shift.

Although not a policy, it should be mentioned that an active campaign has been ongoing against the use of studded tyres (removing the studded tyres would reduce PM pollution) and major steps have been taken to extend and improve bike paths and promote public transport in the Reykjavík area to reduce environmental pressures.

Natural hazards such as periodic volcanic eruptions are an issue of concern for Iceland. The impact these eruptions have on landscape, vegetation, and PM pollution can be very high.

Tourism is another issue causing growing environmental concern. The number of tourists visiting Iceland per year will soon amount to three times the country's population. Almost all tourists visit the same few sites. There is an intense debate over how to manage the Icelandic tourist industry in a sustainable way, especially with respect to the highly sensitive natural sites.

Countries and regions

Ireland

Main themes and sectors addressed in the national State of Environment report

The Environmental Protection Agency (EPA)[1] is required by national legislation to publish a report on the overall quality of Ireland's environment every four years. Ireland's Environment 2012: An Assessment[2] is the most recent and is the fifth such report.

The report provides an assessment of the environment and the pressures being placed on it. It outlines the trends and changes in environmental quality as well as the socio-economic activities that are linked to these changes.

Thematic assessments for water, air, climate change, waste, nature, and land and soil are presented. The final section of the report provides a more in-depth integrated assessment of Ireland's environment, with an extended section on environment & economy and environment & health.

The EPA has developed an online resource[3] to provide regularly updated information across a range of themes using key environmental indicators[4]. The web resource has a series of factsheets, infographics and videos[5] to ensure the main findings of the report are made as accessible as possible.

Key findings of the State of Environment report

> Ireland's Environment 2012 found that overall Ireland's environment remains in a good condition, although there are some areas of concern. The recent economic recession has lowered pressure in areas such as waste generation and greenhouse gas (GHG) emissions. However, the main challenge for Ireland is that as its economy recovers, it does so in a sustainable way. In this context, Ireland's Environment 2012 has identified **four key environmental challenges** for the country (Fig. 1).

Figure 1. Ireland's Environment 2012: An Assessment - Main Environmental Challenges

Challenge 1: Valuing and Protecting our Natural Environment

A good environment is a critical component of a high quality of life, with clean air and safe water being two of our most basic human needs. Meeting the requirements of the Water Framework Directive (WFD) and protecting our water resources in a changing climate are pressing challenges for Ireland. Maintaining our clean air and healthy soil will also require continuing attention, as well as protecting biodiversity and nature from further loss and damage.

Challenge 2: Building a Resource-Efficient, Low-Carbon Economy

Ireland needs to transform its economy into a resource-efficient path, to bring increased competitiveness and new sources of growth. From waste prevention to efficient and renewable energy, investment in this area will position Ireland as a competitive economy as well as allowing us to meet targets under international agreements. Meeting the 2020 targets on GHG emissions is a major task for Ireland.

Challenge 3: Implementing Environmental Legislation

Ireland faces formidable challenges in meeting international obligations including for example on water quality, air quality, GHG emissions and waste management. It is important that Ireland complies with international commitments and ensures that legislation is implemented in a timely and appropriate manner. The EPA and other regulators have an important role to play to ensure that a healthy, safe environment is delivered for Ireland through effective enforcement of environmental legislation at national and local levels.

Challenge 4: Putting the Environment at the Centre of Our Decision Making

Achieving growth that is sustainable means that environmental considerations need to be placed at the centre of policy and decision making. Co-ordinated efforts from Government and public bodies are needed to ensure that existing and future activities maintain and improve the quality of the environment. Business and industry play an important role by ensuring their activities do not cause pollution or create environmental liabilities for future generations. All members of the public must play a part by taking action to avoid pollution and controlling our own environmental impacts.

Main policy responses to key environmental challenges and concerns

Meeting the four environmental challenges are critical to ensure environmental conditions are in place for a successful economy and for the well-being of the public. There is a diverse range of environmental legislation in force in Ireland aimed at improving the quality of the environment and protecting public health and ecosystems. The Government's framework for sustainable development -Our Sustainable Future- is intended to embed sustainability principles across all relevant policy areas, including transport, energy and agriculture.

Water

A review of the water sector in Ireland noted that Ireland's valuable water resources could become of increasing strategic importance to the Irish economy. To deliver a more national approach to water, a new public water utility company (Irish Water) was established in 2013 to take over responsibility for public water services from local authorities. A more sustainable funding model for water services investment is currently being created. New governance arrangements have also been developed to facilitate the implementation of the WFD in Ireland.

Biodiversity

The National Biodiversity Plan 2011-2016 is the main tool by which Ireland seeks to meet its commitments under the Convention on Biological Diversity and the EU Biodiversity Strategy. Three national strategies and plans on peatlands are currently being finalised. These are

- The draft National Peatlands Strategy;
- A draft National Raised Bog SAC Management Plan; and
- Review of the Raised Bog Natural Heritage Areas.

Climate change & Greenhouse Gases

In 2014, the Government published a National Climate Policy Position, together with the final Heads of the Climate Action and Low-Carbon Development Bill[6]. These re-affirm Ireland's commitment to compliance with existing and future obligations under EU and international law. The evolution of national climate policy will be an iterative process, based on adoption by Government of a series of national plans over the period to 2050. Greenhouse gas mitigation and adaptation to the impacts climate change will be addressed in parallel national plans – respectively through National Mitigation Plans and National Climate Change Adaptation Frameworks. These plans are key to enabling the State to pursue a transition to a low carbon, climate-resilient economy in the period to 2050.

Air

The ban on bituminous coal in large cities and towns has greatly reduced levels of particulate matter pollution in these areas. The ban was extended in 2012 and this is expected to further decrease levels of particulate matter across the country.

In 2014, a joint north-south study was commissioned to examine air pollution from residential solid fuel, in particular 'smoky' coal, and to consider potential policy options to reduce emissions on an all-island basis.

Waste

The last decade has seen significant changes in how waste is managed in Ireland. The national landfill levy together with the regulatory regime imposed on the waste industry has yielded significant and measurable improvements in environmental protection.

National policy on waste management is set out in **A Resource Opportunity**[8], published in 2012. This sets out the measures through which Ireland can make further progress to become a recycling society, with a clear focus on resource efficiency and the virtual elimination of landfilling of municipal waste.

Rural Development

In 2014 a consultation paper on a new Rural Development Programme (RDP) 2014-2020 was published. Proposed agri-environmental climate schemes under the RDP are designed to promote the shift towards a low carbon and climate resilient economy and on restoring, preserving and enhancing ecosystems. Farmers participating in such schemes must comply with core management requirements (including nutrient management planning) and undertake priority environmental actions aimed at addressing the cross-cutting objectives of climate change, water quality and biodiversity.

Country specific issues

Meeting the four key environmental challenges is important to preserve and protect the environment as valuable national asset and to support the development of the Green Economy. Addressing the challenges requires concerted and determined action across a range of Government Departments, State agencies and local authorities, working together to tackle these complex issues and implement the right policies and solutions. However, the responsibility of protecting and managing Ireland's environment is a shared responsibility involving all citizens. We need to mobilise each of the more than four and a half million people living in Ireland to ensure that the environment is placed at the heart of everyday decisions and actions.

Clear, accurate and timely information is also vital in raising awareness among the public and among key policy and decision makers. Recent EPA initiatives include:

- **Air Quality Index for Health**[8]: a web-based index, calculated hourly, showing air quality across Ireland and providing health advice.
- A series of **infographics and factsheets**[5] developed for SoE topics to communicate key environmental information.
- **My Local Environment**[9]: A map based section of the EPA's website provides information about the quality of the local environment based on a user defined location.
- **See it – Say it iPhone App**: Allows people to report environmental pollution using their own phone.
- **Bathing water: SPLASH**[10]**:** A map-based service which provides information on bathing water quality.

Countries and regions

Italy

Main themes and sectors addressed in the national State of Environment report

In accordance with law No. 349/1986[1], the Italian Ministry of the Environment (MoE) submits its State of the Environment Report[2] to the parliament every two years. Most of the information for the State of the Environment Report[3] comes from the Environmental Data Yearbook[4], which is published annually by ISPRA (Institute for Environmental Protection and Research[5]) with the collaboration of Italy's regional/provincial environmental protection agencies.

The Environmental Data Yearbook-Key Topics[6] deals with a variety of environmental issues that are considered priority areas by the EU. These issues include:

- Climate change
- Biodiversity and ecosystems
- Air quality
- Inland water quality
- Sea and coastal areas
- Exposure to physical agents
- Nuclear activities and environmental radioactivity
- Environmental hazards
- Soil and land
- Waste
- Resource use and material flows
- Environment and health
- Instruments for environmental knowledge and awareness
- Environmental certification

Key findings of the State of Environment report

Climate change

During the last 30 years, the Italian mean temperature anomaly (a measure of how the average temperature in Italy in any given year differs from a historical, multi-year average) was almost always higher than the global over land air temperature anomaly. In 2013, the mean temperature anomaly was +1.04° C in Italy, compared to the global mean of +0.88° C[7].

Total greenhouse gas emissions, in CO_2 equivalent and excluding emissions and removals from LULUCF, decreased by 11.4% between 1990 and 2012. Italy's Kyoto target is to reduce annual emissions by 6.5% between the base year (1990) and the period 2008-2012 (which is calculated by taking an average of annual emissions in that four-year period). Comparing the average annual emissions in the 2008-2012 period to the emissions in the base year, Italy's level of emissions decreased by 4.6%.

Italy will meet its Kyoto target for the 2008-2012 period by using the credits arising from Kyoto Protocol mechanism and forestry activities[8].

Air quality

In 2012, Italy had satisfactory levels of air quality concerning sulphur dioxide and benzene. However it had unsatisfactory concentrations of PM_{10} (the daily limit value was exceeded at 40% of monitoring stations), ozone (the long-term target for human-health protection was exceeded in 93% of monitoring stations) and nitrogen dioxide (the annual limit was exceeded in 17% of monitoring stations).

Water quality/ Sea and coastal areas

In Italy and the Mediterranean, marine coastal zones remain among the most vulnerable and most seriously threatened natural ecosystems. There are many sources of pollution that can render water unfit for swimming, but the most significant source is microbiological pollution. For the 2012 bathing season, Italy counted 629 inland waters and 4 880 marine and transitional waters for a total of 5 509 bathing waters. The results of the monitoring carried out during the 2012 bathing season show 85% of these waters were in compliance with the guideline value established by Directive 76/160/EEC.

Biodiversity and activities on ecosystems

Of all the European countries, Italy has one of the largest stores of biodiversity, accounting for half the plant species and a third of the animal species occurring in Europe. About 31% of vertebrate species are threatened, with amphibians and cartilaginous fishes a particular cause for concern. About 15% of the higher plants and 22% of the lower plants (bryophytes and lichens) are threatened.

Soil and land

At the national level, ISPRA data[9] show that artificial land cover reached 7.3% in 2012 (Figure 1). This means that, on average, more than 7 square metres of soil a second were built over since 1950. The pace has increased in recent years. Between 2009 and 2012, the consumption of soil was approximately 8 metres per second.

Environmental hazards

Landslides are the most commonly occurring type of natural disaster in Italy. They are second only to earthquakes in terms of the number of victims and the amount of damage they cause.

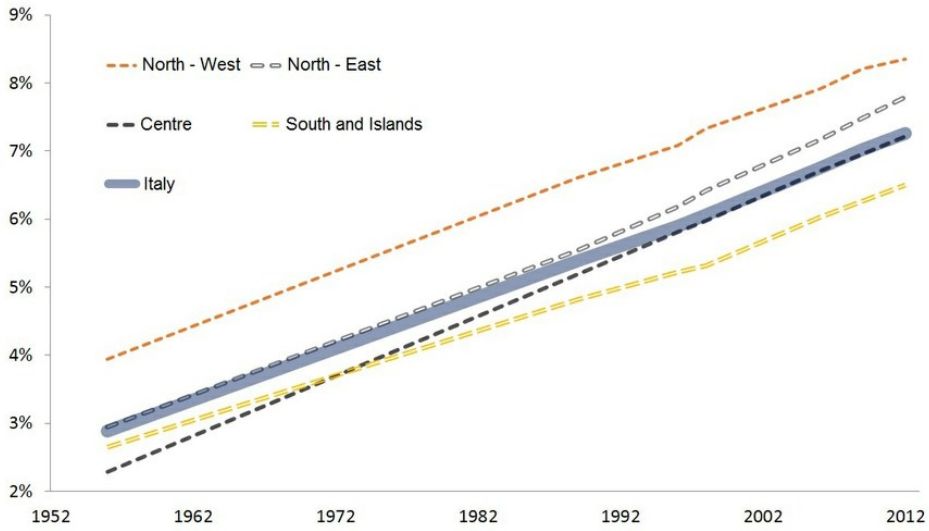
The population potentially exposed to landslides every year is 995 484 people spread out over 21 182 km² (7 % of the national territory). In 2013, 112 major landslide events were recorded. It is estimated that every year 6 153 860 people are exposed to the effects of flooding in Italy. Floods in Italy killed 1 557 people from 1951 to 2013.

Waste

Total municipal waste in 2013 was about 29.6 million tonnes, 1.3% less than in 2012. Waste generation per person fell from 505 kg/person in 2012 to 487 kg/person in 2013. In 2013, about 37% of municipal waste was disposed of in landfill, but 39% was sento to material recovery (including composting and anaerobic digestion of biowaste)[10].

Separate collection of different waste streams is recognised as essential for the effective recycling of the different components of municipal waste. In 2013, 42.3% of total municipal waste was separately collected.

Figure 1. Soil consumption trend, 1950s - 2012[9]



Source: ISPRA

Main policy responses to key environmental challenges and concerns

Despite recent progress, Italy still faces important environmental challenges[11], such as climate change mitigation, climate change adaptation, urban air quality, waste management, ground water pollution, groundwater over-exploitation, and hydro-geological instability.

Climate change

In order to help mitigate climate change, Italy has adopted the European emissions trading system. It has also promoted energy-saving measures, renewable energy, and low-environmental-impact fuel in the transport sector. As regards adaptation, the process for the adoption of the National Adaptation Strategy is in progress.

Waste

There is considerable diversity between different regions of Italy when it comes to progress in waste management. Further effort will need to be made to achieve the targets set out in Directive 2008/98/EC, especially with regard to the prevention and recycling of municipal waste. In 2010, Italy implemented directive 2008/98/EC to promote upstream waste reduction and the separate collection of different waste streams. This will help to develop the waste management industry and create new jobs in waste management.

Sea and coastal areas

The Marine Strategy Framework Directive (2008/56/EC) is an important and innovative tool since it is the first binding instrument to consider the marine environment as a precious resource to be protected and – where possible – restored. Italy has already begun to implement the MSFD in its seas. It has drafted an initial assessment of

the state of the marine environment, based on existing data and information. It has also created a definition of 'good marine environmental status' on the basis of 11 qualitative descriptors of the marine environment, comprising data on issues such as biodiversity and pollution.

Italy is now designing a monitoring programme for the continuous evaluation of the state of the environment of marine waters.

Soil and land

Italy has enacted a soil-protection law, which ensures the protection and recovery of soil and subsoil, the maintenance of soil-based water-functions and ground water, and the restoration of soil polluted with hazardous substances.

Green growth

As Italy recovers from the effects of the economic crisis, it is looking to 'mainstream' environmental concerns into its economic policy[12]. This 'Green Growth' agenda comprises:

- Economic policy and the environment
- Greening the tax system
- Environment-related expenditure and investment
- Expanding environment-related markets and employment
- Promoting environmental technologies and eco-innovation

> Greening the tax system is a particularly promising area. Italy hopes to alter its taxation system to receive a smaller share of taxation revenue from income tax, and a larger share of revenue from taxes on polluting activities.

Country specific issues

Italy is particularly susceptible to hydro-geological instability, due to its geological and geomorphological characteristics, the impact of weather and climate factors, and the widespread, uncontrolled presence of human activities. Land use is an especially important policy area in this regard.

ISPRA and the environmental protection agencies at the provincial and regional level monitor soil-sealing activity and land-take across Italy. This monitoring activity helps to shape and assess policies at national, regional, and municipal levels.

Countries and regions

Kosovo*

*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Main themes and sectors addressed in the national State of Environment report

The Report on the State of Environment is a basic document that presents the state of environment in Kosovo. Its compilation is based on the **Law on Environmental Protection**[1] and the objectives and priorities in the environmental sector. The report is prepared annually. The **Kosovo Environmental Protection Agency** (KEPA) is responsible for coordinating and drafting the report.

The data presented in the report are based on the **National System for State of Environment Monitoring**. The report also includes data that are received from institutions that have specific responsibilities in the environmental sector. The Report on the State of Environment 2011-2012 is the latest official report published by KEPA. The report is partly based on the **DPSIR** framework. It is more focused on the **State** of the Environment and **Responses**, and less on the description of **Drivers, Pressures and Impacts**. It only makes use of a few **environmental indicators**. The key environmental topics addressed by the report are: air, water, soil, nature conservation, waste, public health, and measures for environmental protection.

Key findings of the State of Environment report

> Kosovo is still in the phase of economic recovery. It is one of only four countries in Europe that recorded positive economic growth rates in every year of the crisis period 2008-2012, averaging 4.5%.

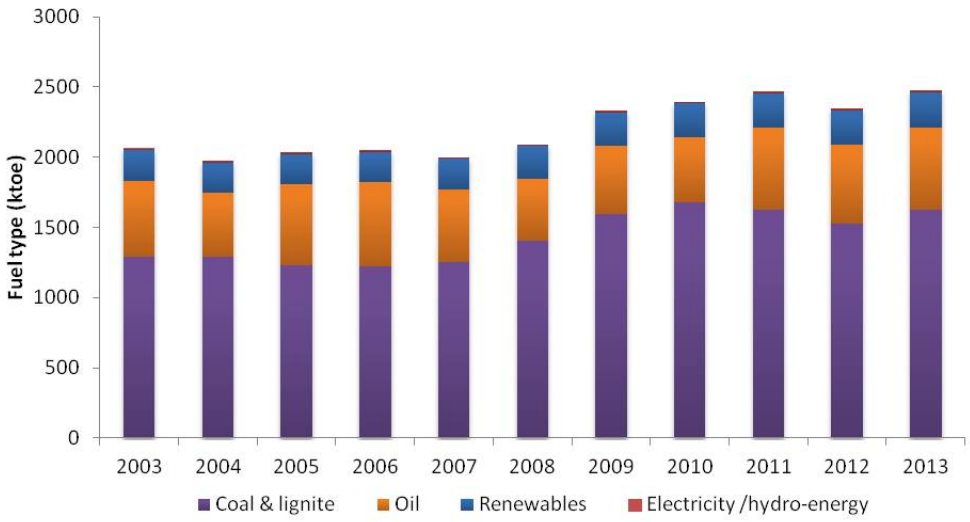
Gross Domestic Product (GDP) in Kosovo expanded by 3.8% in 2012 from the previous year. However, Kosovo remains one of the poorest countries in Europe, with a per-capita gross domestic product (GDP) of about €2,700[2].

Under such circumstances, there continues to be strong demand for natural resources. Currently, in addition to industry and transportation, the **energy sector** has the greatest impact on the environment. Coal accounted for 64.8% of **primary energy consumption** in 2012, although coal use fell by about 6% compared to 2011. Lignite was the predominant product, accounting for 97.4% of the total coal used. **Renewable energy sources** represent only about 9% of primary energy consumption (Fig.1)[3].

The air-quality monitoring data shows that the highest limit-value exceedances were recorded for PM_{10} and $PM_{2.5}$, especially during the winter season[4].

According to the results, **total greenhouse gas (GHG) emissions** in Kosovo in 2009 were 10.5 Mt CO_2 equivalent. Carbon dioxide represents around 80% of all emissions, while methane and nitrous oxide together represent around 10%. The most important GHG inventory sector is "fuel combustion activity", which accounts for roughly 80% of all emissions[5]. Kosovo has not yet determined the reference year for its GHG inventory.

Figure 1: Primary energy consumption by fuel in Kosovo



Source: Ministry of Economic Development, 2013

Kosovo's population continues to grow, and therefore there has been an increase in settlement expansion, and **land use changes**. In 2012, settlements covered 4.7% of Kosovo's territory, compared with 3.7% in 2002. Agricultural lands decreased from 31.3% of Kosovo's territory in 2002 to 27.8% in 2012 (due to the expansion of settlements). Forest lands increased from 42.1% of Kosovo's territory in 2002 to 44.7% in 2012[6].

In 2012 around 78% of the population was supplied with water from the public water supply (4 % more than in 2011), while around 56% of the population had access to waste-water services (5% more than in 2011)[7].

The quantity of **waste generated** in kg /capita in Kosovo has shown an increasing trend, rising to 335kg in 2011-2012, compared with 297 kg in 2010. Kosovo's municipal waste is composed of:

- organic waste (42%)
- plastic waste (11%)
- paper (8%)
- wood waste (7%)
- metal waste (6%)
- glass waste (6%)
- other waste (13%)[8]

In order to contribute to **biodiversity protection**, Kosovo compiles the **Red Book of Vascular Flora**, an assessment of the status of vascular plants. This assessment study has concluded that among Kosovo's vascular flora species, there are:

- 61 species in the 'critically endangered' category
- 86 species in the 'endangered' category
- 19 species in the 'vulnerable' category
- 34 species in the 'nearly threatened' category
- 35 species in the 'least concern' category[9]

Main policy responses to key environmental challenges and concerns

Kosovo is still in the early stages of adapting and **implementing environmental standards** under the requirements of the European Union. At this stage, the efforts of national institutions are focused on completing the legislation and **transposition of EU Directives** into national law, strengthening the strategic and institutional framework, and increasing investment in the environmental sector.

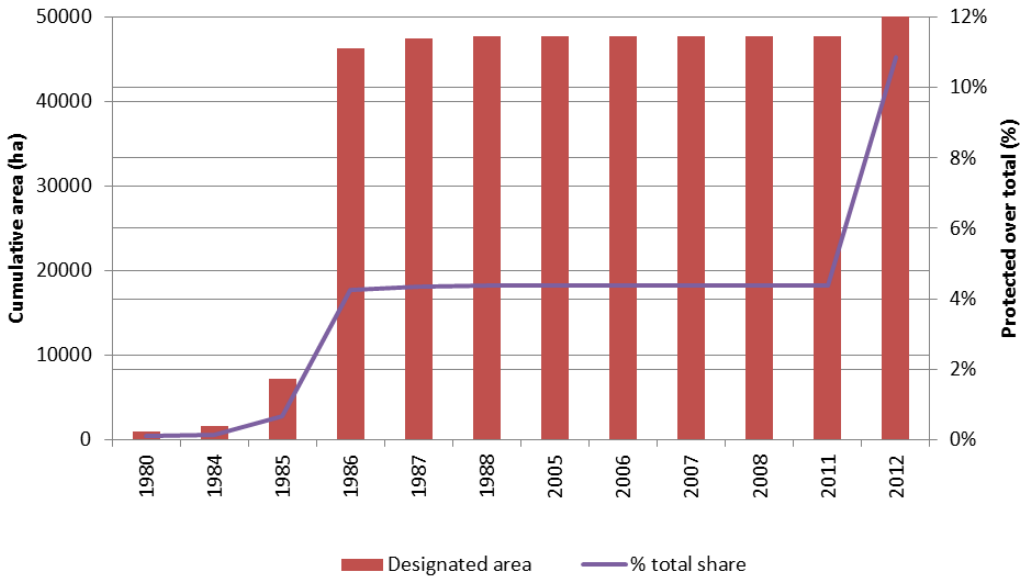
> According to the 2012 assessment, about 60% of the overall EU **environmental acquis** has been transposed into Kosovo's national environmental legislation[11].

In 2013, Kosovo approved: the Strategy for Environmental Protection and Sustainable Development 2013-2022, the National Environmental Action Plan 2013-2017, the Air Quality Strategy 2013-2021, and the Biodiversity Strategy and Action Plan 2011-2020. The following initiatives are still in the approval stage: the Waste Strategy and Action Plan, the Framework **Climate Change** Strategy, the Water Strategic Plan and the Management Plan for River Basins. These documents determine for each policy area the necessary measures for environmental protection and the measures to be taken for climate-change adaptation and mitigation.

In order to strengthen its **Environmental Monitoring System**, Kosovo's network of air-quality monitoring stations is being expanded. Currently, the National Air Quality Monitoring Network consists of 12 automated static stations.

In 2012, Kosovo announced the creation of its second national park Bjeshkët e Nemura (62.488 hectares), and it also expanded the territory of its first national park, Sharri. These two actions increased the total share of protected areas in Kosovo from 4.4% to 10.9% of national territory (fig.2)[8]. Besides its two national parks, Kosovo has 97 other **Nature Protected Areas** of various categories.

Figure 2. Trend in the cumulative surface of protected areas in Kosovo



Source: Report on the State of Environment 2011-2012

Investments in the environmental sector are oriented toward the rehabilitation of industrial waste landfills, the closure of old landfills, and the construction of facilities for temporary storage of hazardous waste.

Meanwhile, investments in the water sector are mainly focused on the public water supply network, the drafting of feasibility studies, and the construction of waste-water treatment plants (the lack of waste-water treatment plants is one of the major problems in the water sector).

Country specific issues

Kosovo in regional and cross-border cooperation

In order to strengthen the protection of biodiversity and the **management of protected areas** at the regional level, Kosovo is actively participating in several regional and **trans-boundary initiatives** and projects. Some of these initiatives are described below.

The establishment of the Bjeshkët e Nemuna Mountains trans-boundary protected area. The proposed protected area Bjeshkët e Nemuna Mountains is expected to involve Albania, Kosovo, Montenegro and Serbia. The Bjeshkët e Nemuna Mountains encompass areas of unique landscape and are one of the most important regions for the protection of biodiversity in the Balkans and in the whole of Europe. This region is considered to be the most inaccessible mountain range in Europe, and the wildest range on the Balkan Peninsula. It is an extremely harsh mountain environment, with extremely hard living conditions for its inhabitants [11].

The establishment of the Sharr–Korab–Deshat trans-boundary protected area. The region of the proposed trans-boundary protected area Sharr–Korab–Deshat is located in the border areas of Albania, Kosovo, and the Former Yugoslav Republic of Macedonia. It encompasses areas of unique landscape and natural values for Europe. This area harbours two mountain ranges of the alpine landscape, vast mountain grasslands, and forests that include primeval tree stands of the endemic pine. This trilateral border region is home to a considerable number of natural habitats and endemic, relic, rare, and threatened flora and fauna species. Some of these are species of common European importance like the brown bear, wolf, and Balkan lynx, the habitats of all of which are in areas that straddle the state border[12].

The Dinaric Arc parks project. The main objective of the Dinaric Arc parks project is to create a network of protected areas by connecting all the nature parks and national parks in Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia and Slovenia. The Dinaric Arc is a region of south-eastern Europe that covers some 100 000 km2 and more than 6 000 km of coastline, stretching over the entire area facing the Adriatic Sea from Trieste (Italy) to Tirana (Albania)[13].

Countries and regions

Latvia

Main themes and sectors addressed in the national State of Environment report

> The national State of Environment (SOE) report is based on a deep analysis of trends. It provides an understanding of policy implementation efficiency. The SOE is defined by Article 10 (6) of the Law on Environment[1] of the Republic of Latvia and is carried out by the "Latvian Environment, Geology and Meteorology Centre"(LEGMC).

The SOE must be released at least once every four years and be placed on the homepage of the Ministry of Environmental Protection and Regional Development (MEPRD). The SOE reflects the overall state of environmental health of the country. The currently SOE (National Report on the State of Environment of Latvia 2008–2011)[2] was prepared in 2012 and published on the internet in 2013.

The methodology is based on selected indicators and monitoring. The latter consists of state and pollution monitoring carried out by the operators themselves. Another important source is statistics on energy use, production and emissions. Information can be taken by data from international and national projects and from scientific research.

Key findings of the State of Environment report

> As the state of environment in Latvia is relatively good, the SOE report does not provide additional information such as annual or other operative statistics, pollution data bases, or reporting obligations to the UN or EU institutions.

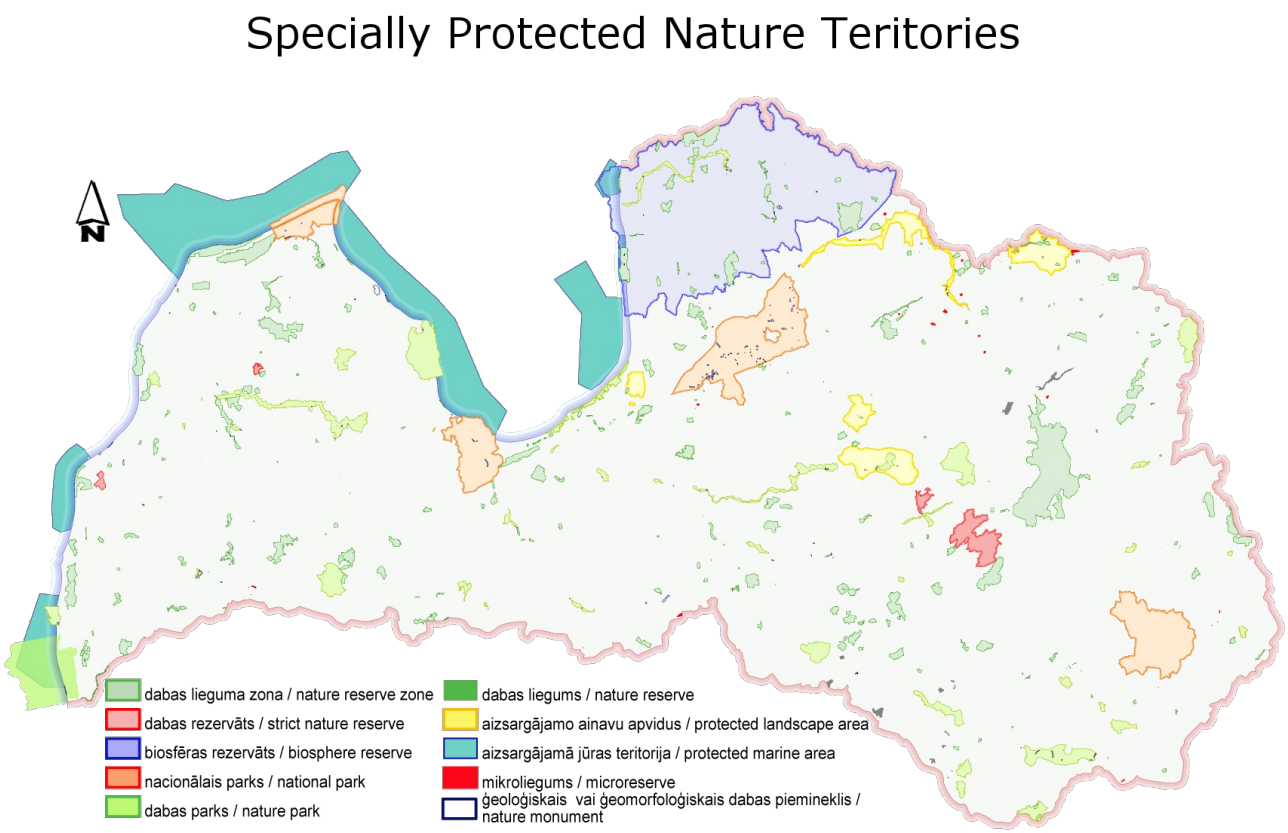
Latvia is one of the countries in Europe with the richest biodiversity and an established tradition of nature conservation.

One problem is that the majority of databases and reports are made according to specific sector-based fiches. The SOE provides an integrated look at the various problems in simple and understandable language, informs about transboundary pressures, and explains regional differences. The SOE supports political decision-makers at the regional and local level.

The SOE also compares developing pressures on the environment with the pressures from nature protection limitations and number of territories through to local government, agriculture and households.

Even if there are no large environmental challenges at the country level, there are plenty of smaller regional or local environmental problems. Some of these problems may have an impact on international reporting obligations such as air pollution.

Figure 1. Specially protected nature territories in Latvia



Source: Nature Protection Agency of Latvia

Main policy responses to key environmental challenges and concerns

For some time the state of environment had been highly evaluated in the majority of assessments prepared by the EEA. Generally Latvia complies with the requirements under the UN MEAS or EU Directives with some small exceptions. During the last decade Latvia has been ranked among the ten environmentally best countries of the world in the Environmental Performance Index (EPI) list. In 2013 the country was ranked second.

Latvia is a sparsely populated country with 50% of its territory covered by forests, with a comparably low economy intensity per capita, and a declining number of inhabitants. Sometimes the EPI ranking does not really reflect country environmental footprints.

Generally the state of Latvian environment can still be evaluated as "good" because there are no real threats to air quality, water quality, land degradation, municipal services etc. The majority of environmental problems are local, such as a slight exceedance of certain air pollutants in some parts of the capital Riga or some historically polluted spots. Nevertheless the most up-to-date records show that, affected by the financial crises, Latvia had failed to some extent to implement a new and more ambitious and efficient environmental policy, and dropped down in related rankings. The 2014 EPI shows a sharp fall back for 40 locations, but it does not mean that Latvian environment has run in problems. The weaknesses and bottlenecks are well known and Environmental Policy Strategy (EPS) 2014-2020 is already focused on effective actions.

Currently the Environmental Policy Strategy (EPS) for the period 2009-2015[3] was replaced by one covering the 2014-2020 period. This is linked with the Latvian National Development Plan for the period 2014-2020[4] and focuses on the aims of the EU's 7th Environmental Action Program. EPS implementation is subject to regular controls by the Government and Parliament and scope of control is more oriented to the implementation of tasks.

The main sectors of EPS are as follows:

- Horizontal issues (environmental communication, capacity, and public involvement);
- Soil and subsoil (reuse and recovery);
- Nature protection;
- Air protection;
- Climate changes and mitigation;
- Water resources and protection of the Baltic Sea;
- Environmental pollution and risks;
- Environmental health.

The main problems are:

- minor overexploitation of some natural resources, e.g. forests, fish resources;
- lack of relevant and scientifically based evaluation of species and biotops;
- insufficient management of particularly protected areas; and poor actions against aggressive invasive species.

All these weaknesses are a heritage from the budget reduction of 2009 connected with limited policy implementation during recent years. In addition, environmental policy is becoming more and more ambitious and pressures from international biodiversity protection or birds' protection targets are growing. Similarly, water quality targets or air protection targets have became rather ambitious and issues such as intercalibration or scientific assessment put more and more stress on smaller countries with lack of sufficient background and capacity on such aspects.

As Latvia is one of the Baltic Sea region countries, Baltic marine protection issues wind through all environmental policy documents. Latvian environmental policy should be viewed in the context of the Baltic Marine Environment Protection Commission - Helsinki Commission (HELCOM) or the Action Plan for the EU Strategy for the Baltic Sea Region[5]. In this respect, particularly in relation to the EU Marine Strategy Directive, the initial assessment of the marine environmental status[6], prepared by the Latvian Institute of Aquatic Ecology in 2012 and published in 2013, is of major importance. Just as in other Baltic Sea States, Latvian environmental policy is much focused on the reduction of land based pollution as a possible source of pollution of the sea.

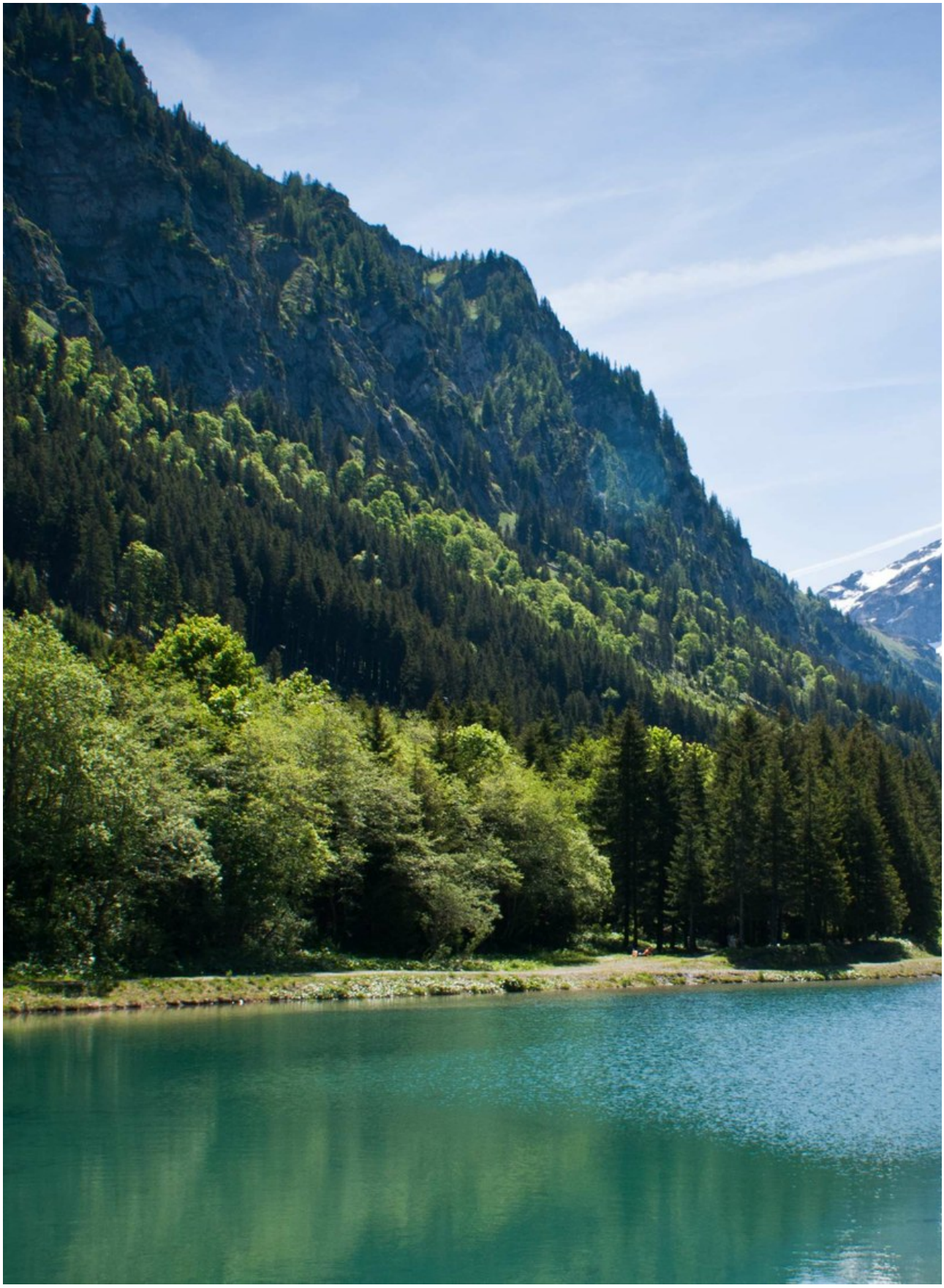
Country specific issues

Like other countries with a small territory, Latvia is not in a position to evaluate independently the dynamics of global or regional environment or climate change risks. The territory is small so monitoring is limited, and participation in international projects is rather low. Therefore Latvia highly evaluates global, EU, Nordic and Baltic information systems and evaluations, as they broaden national outlooks and expand the context of the national SOE. The principle problem is being able to harmonise and streamline between global, regional and national monitoring and state of environment evaluation.

Latvia is among the countries influenced by transboundary impacts. Long range air pollution impact on local air quality, whilst more than 50% of water resources originate in neighbouring countries. Water resources are therefore under the permanent threat of transboundary pollution and accidents. In particular transboundary water management is still a problematic issue outside the EU. Transboundary water resources also mean that transboundary nutrients run into the Baltic Sea. HELCOM is working on improving the evaluation of this element under the latest Pollution Load Compilation (PLC-6) exercise.

Another important problem for Latvia is transit business crossing the country. Even if the infrastructure in the country is well developed, pipelines and railway traffic can cause accidents which can be reduced by proper preparation, risk evaluations and trainings. It is more difficult to reduce air pollution and road-side pollution from heavy and light road transport, as these units cross the country at speed. This puts pressure on the waste and packaging waste management system and municipalities.

In addition, an increased interest in the use of maritime space for economic development can cause potential accidents both from maritime transport, as well from offshore energy infrastructure.



Countries and regions

Liechtenstein

Main themes and sectors addressed in the national State of Environment report

Liechtenstein first compiled an environmental report in 2004. Since 2010 the regular environmental statistics have been published.[1] The legal provisions for the environmental statistics are contained within the Statistics Act.[2]

The statistics aim to illustrate the condition and development of Liechtenstein's environment as well as to provide comparative data to other countries.

These statistics contains tables, partially dated back to the seventies, and extensive maps for visualizing tables and indicators. Templates for those indicators came from the environmental indicators of the Swiss Federal Office for the Environment (FOEN) and the Swiss Federal Statistics Office (FSO), and indicators for sustainable development of the Statistical Office of Liechtenstein. The Environmental Statistics consists of three parts.

- The first part presents the results of new environmental statistics and compares these with previous years as well as other countries.
- In the second part, detailed data tables and maps as well as indicators are listed.
- The third part describes the methodology used in the environment statistics.

The following environmental issues are analysed:

- air,
- climate,
- water,
- soil,
- landscape,
- biodiversity,
- forests,
- waste,
- noise, and
- environmental levies.

Key findings of the State of Environment report

Liechtenstein selected and described five important environmental topics as key findings: particulate matter air pollution, greenhouse gas emissions (GHG), forest habitats, waste and traffic noise. As those issues are up for discussion on a regular basis in the environment sector those key findings were selected as they are recurrently debated in Liechtenstein.

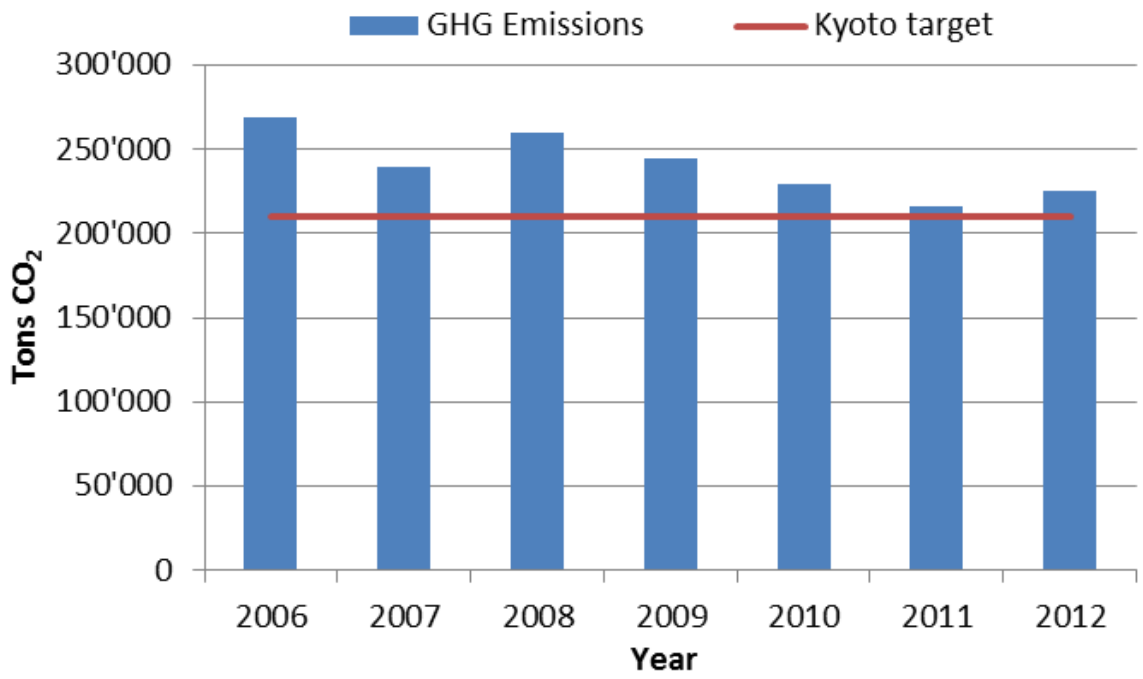
Particulate matter air pollution decreases (PM_{10})

Particulate matter pollution has been reduced in 2012 compared to the previous year. Nitrogen pollution was also lower in 2012 than in 2011. However, the limit values at various locations were regularly exceeded. The ozone concentration exceeded the limit in 2012, despite a decline compared to the previous year.

Greenhouse gas emissions are above the target value

In 2012, 225 400 tonnes of CO_2 equivalents were emitted. Thus, GHG emissions exceed the amount, stipulated in the Kyoto Protocol target for the period 2008 to 2012, of average 25 248 t per year. 2011 was the first time the greenhouse gas emissions were below the 1990 reference values (228 100 t).

Figure 1: Total greenhouse gas emissions within the first commitment period



Source: Liechtenstein's National Inventory Report 2014
Note: The red line represents the Kyoto target (-8 % of 1990 emissions)

Forest habitat quality increases

The forest habitat value is an ecological index for the quality of the forest as a habitat for animals and plants. In 2010, according to the forest inventory of Liechtenstein, 35.3 % of the forests exhibited a high habitat value. Thus, the share has increased by 24.2 % in the last 12 years. In 1998, 11.1 % of the forests were classified with a high habitat value.

Municipal waste slightly decreases

In 2012 about 28 200 t of municipal waste were generated. Compared to 2011 the municipal waste decreased by 200 tonnes. The recycling rate was 64.6 % in 2012. Hence, it has risen slightly compared to 2011 when it was at 64.1 %.

13 % of the general public is affected by road traffic noise daily

In 2010 4 741 persons were burdened by traffic noise of 60 dB (A) or more. This corresponds to 13.1 % of the population. At night 3 587 persons or 9.9 % of the population were exposed to traffic noise of 50 dB (A) or more. The noise exposure is thus significantly reduced during the night compared to the day.[3]

Main policy responses to key environmental challenges and concerns

Liechtenstein, as a member of the Convention on Biodiversity, aims to strengthen the protection and sustainability of biodiversity. For sectors with biodiversity many concepts and approaches already exist. Examples include nature and landscape protection for Liechtenstein forests; the development of nature and agriculture; as well as regional cooperation such as in the Alpenrhein area.

In the current revision of the Water Protection Ordinance the space occupied by water in Liechtenstein is defined. Defining this "water space" allows for sustainable and spatial planning backup to take place as regards flood protection and the maintenance of ecological integrity. The use of this space by agriculture is limited by law as well as any structural use.

For the water space calculation the dimension of the natural channel width of a waterbody, if enabled to flow freely under natural conditions, serves as the basic input.

A water body in ecologically valuable areas or used for agriculture is allocated even more space using an additional biodiversity curve.

In addition to preserving a self-cleaning capacity, the linking of habitats and a reduction in nutrient input, conservation of specific areas also has priority.

Protecting water bodies for future generations against buildings and fixed construction is an important part of the riverine zone policies.

Liechtenstein has integrated its climate policy very strongly into individual sectorial policies. The focus is on energy, environmental, transport, agricultural and forestry policies. All of these areas encompass measures that contribute to the reduction of climate gases. In order to ensure a coordinated implementation of climate policies within the various areas, the government passed a Climate Protection Strategy in 2007. The Strategy requires an interdisciplinary coordination in the fields of environment, energy, building, transportation, agriculture and forestry with respect to the development of climate policy measures. The strategy will be revised in the course of 2014.

Liechtenstein's Ministry of Environment and the Office of Environment are the coordinating authorities with respect to the execution of the Climate Protection Strategy. Because of the small size of the country, however, cross-border cooperation plays an important role. Especially important is the relationship with Switzerland and cooperation among the countries in the Lake Constance area. Thanks to the Customs Treaty, cross-border measures and bilateral execution are simplified in many areas, since various Swiss enactments are directly applicable in Liechtenstein pursuant to the Treaty. In these cases, Liechtenstein executes the provisions similarly to a Swiss canton (e.g. mineral oil tax).

Accordingly, most policy areas are very closely linked with Swiss policy, in terms of both content and execution. Due to this circumstance Liechtenstein, as an EEA Member State, always evaluates Swiss as well as European law.

In addition to the above mentioned policies the LIFE Climate Foundation must be mentioned. The LIFE Climate Foundation is a nonprofit organization that aims at the promotion of a sustainable and credible advancement of climate and environmental protection through an effective inclusion of financial intermediaries and the general public.

Country specific issues

As Liechtenstein is a small country the financial and capacity resources are limited. In addition, Liechtenstein's engagement with regard to research and systematic observation that address international activities is very limited.

Since 2012 the Government provides financial support to the LIFE Climate Foundation Liechtenstein [4] (established in 2009) on a regular basis. The nonprofit foundation therefore concluded a cooperation agreement with the Swiss Climate Foundation. Since 2012 Liechtenstein based SMEs are eligible to apply for financial support if they implement efficiency measures or if they seek financial help for the development of innovative projects that demonstrate a GHG mitigation impact. In addition, LIFE Climate Foundation is a national initiative and aims to further strengthen public awareness by organizing events and workshops which cover the topics of climate change and other ecological topics.

The foundation acts within the framework of a Public-Private Partnership. The participation of representatives from the country's economy as well as from science and policy sectors provide important access to the relevant players and driving forces within environmental and carbon markets. The close cooperation with the University of Liechtenstein's Institute for Financial Services offers the possibility to examine environmental questions related to financial issues on an academic basis. Further information is available on www.climatefoundation.li

Countries and regions

Lithuania

Main themes and sectors addressed in the national State of Environment report

Reports on the state of the environment according to Driving Forces-Pressures-State-Impacts-Responses (DPSIR) framework in Lithuania have been published since 2001. Since 2006, the Environmental Protection Agency (EPA) publishes "State of the Environment. Only Facts" publication on an annual basis. It briefly discusses the most pressing environmental issues in Lithuania, using interrelated groups of about 85 indicators. The following topics are reflected in the latest SOER[1] (published in 2013):

- overview of the key elements of climate change;
- key changes in air emissions, ambient air quality and progress in use of renewable energy resources;
- quality of water and wastewater;
- waste sector overview;
- status of biodiversity, landscape and protected areas; and
- environmental impact assessment, economic pollution prevention measures and environmental accidents.

Since 2008 every five years a more thorough publication, "Lithuania's Environment: State, Processes and Trends", is issued, which is designed not only to review changes in the environment, but to analyse the reasons for these changes, the main environmental achievements and challenges, as well as presenting possible scenarios for the selected environment sectors in the near future[2].

Key findings of the State of Environment report

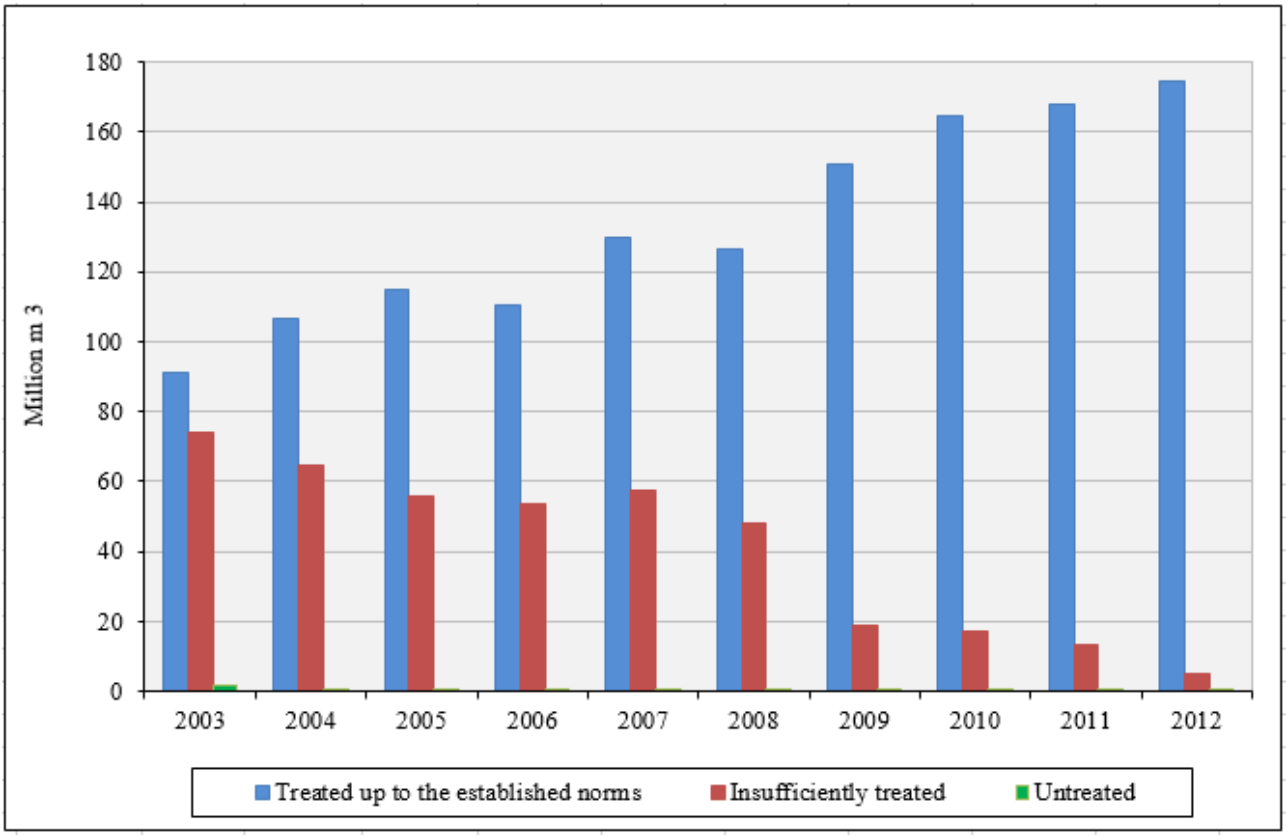
> Lithuania managed to achieve GDP growth faster than growth in greenhouse gas (GHG) emissions, implementing the European Union's (EU) Sustainable Development Strategy.

Annual GHG emissions in Lithuania amount to 4-5 tons per capita and are among the lowest in the EU[2]. Total GHG emissions in 2012 were 55.6% below base-year (1990) levels. However, the energy sector remains a major source of GHG emissions (61.7% in 2010), as well as agriculture (21.4%), industry (10.8%), waste sector (up to 5.6%)[2]. In 2012, the energy produced from renewable sources amounted to 17.3% of primary energy and has doubled over a decade.

In 2012, the annual average concentrations of major air pollutants in urban areas did not exceed the limit values. The amount of main air emissions in 2011 fell by 7%, compared to the previous year. This indicates a successful implementation of cleaner technologies in industry. However, benzo(a)pyrene concentration in ambient air is increasing and it is partly associated with the increasing use of biofuels in energy companies and households[1].

Wastewater quality after treatment is rapidly improving. In 2012, up to 97% of wastewater from households and industry has been cleaned to the standards (Fig.1). An increase in the efficiency of wastewater treatment plants led to a stipulated reduction of the quantity of pollutants by 14% in 2012 compared to 2011. In 2012, the pollution load from wastewater discharges from all cities and settlements with a population greater than 2 000 was significantly (23-45%) lower than in the period 2008–2009[1].

Figure 1: Changes in household and industry wastewater treatment quality, 2003-2012

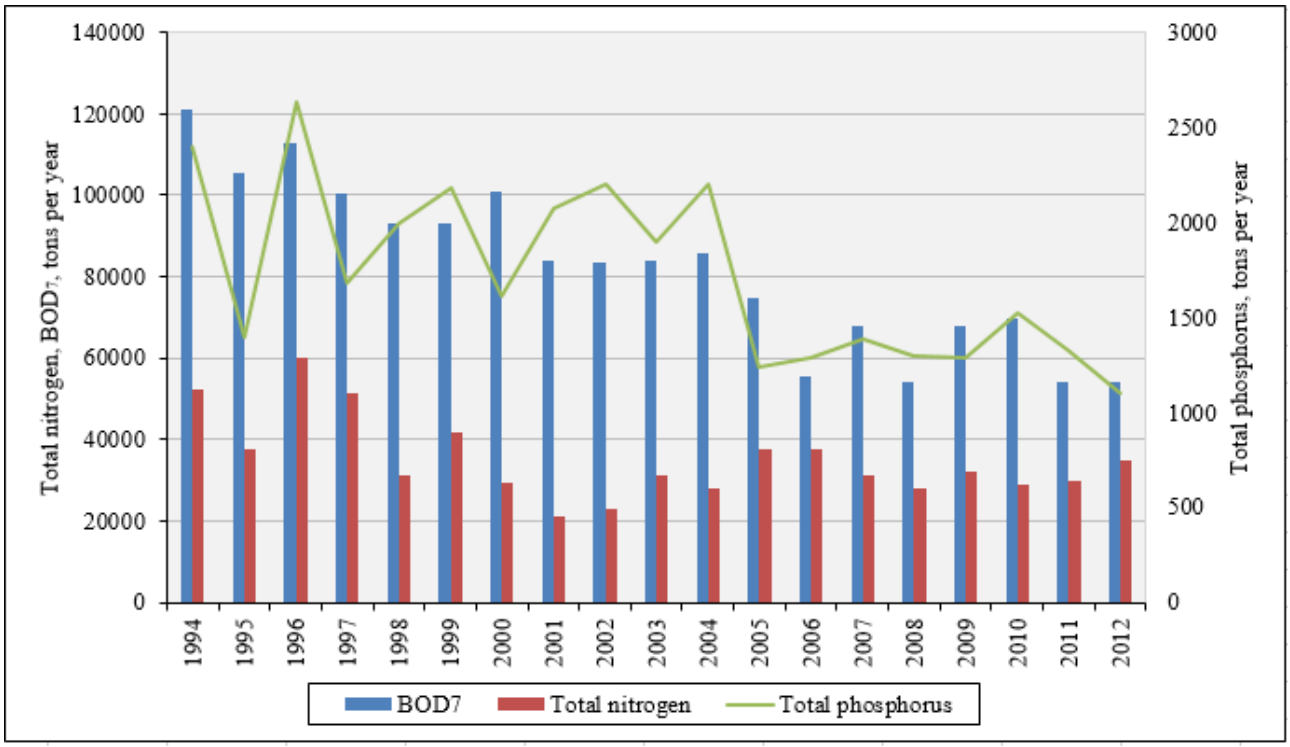


Source: Environmental Protection Agency

Effective wastewater treatment has a positive effect on surface water bodies, and particularly on the largest Lithuanian inland water body. The ecosystems of the Lagoon are highly dependent on the input of pollutants from rivers. During the period 1994–2012, downward trends were apparent for phosphorus and BOD_7. The most significant drop in pollutant concentrations was observed during the period 2004–2005, following the modernisation and expansion of wastewater treatment facilities. In 2012, compared with 2011, phosphorus inflow into the Lagoon and BOD_7 decreased by 12%. The total nitrogen inflow since 1998 has no clearer trend, as a large part of this consists of diffuse pollution from agriculture, which is more complicated to control[2] (Fig.2).

In 2011, the 78% of municipal waste was disposed of in landfills, reaching 434 kg per capita. Comparing with 2010, the use and export of municipal waste has increased by 50%, but the largest share of it (76%) consists of scrap metal, which usually does not arrive in landfills. Collection of industrial waste per unit of GDP is declining since 2004, with only a slight increase during the economic slump (2009-2010), followed by a clear decrease in 2011, falling below the pre-crisis level[1].

Figure 2: Changes in the flow of pollutants into the Curonian Lagoon, 1994-2012



Source: Environmental Protection Agency

Main policy responses to key environmental challenges and concerns

Lithuania has continued to contribute with efforts to solve global climate issues. In order to foster further reduction of the GHG emissions, several resolutions were adopted during the period 2010-2012:

- National Strategy for Climate Change Management Policy[3], establishing the national target to lower GHG emissions by 15% (compared to 2005, non-trade sector) until 2020. This goal was supported in 2013 by the Inter-institutional Action Plan for the Implementation of the National Climate Change Management Policy Strategy 2013-2020[4];
- National Strategy for the Development of Renewable Energy Resources[5], aiming to increase final energy consumption from renewable energy resources by at least 23% until 2020;
- National Energy Independence Strategy[6], indicating the key initiatives for the energy sector stability in the future: the regional Visaginas nuclear power plant construction, renewable energy use development and increasing of energy use efficiency.

In order to improve the water bodies management and protection system, safeguarding more sustainable use of water resources, protection of the good status of water bodies and water quality assurance, in 2012 the Government of the Republic of Lithuania adopted list of measures[7]. This included the preparation of Nemunas, Venta, Lielupė and Dauguva river basin districts management plans and establishing programmes to achieve the water protection objectives for the period 2016-2021, development and installation of the system of flood monitoring, evaluation and risk management.

In order to comply with the HELCOM Baltic Sea Action Plan and Marine Strategy Framework Directive, the Baltic Sea Environment Protection Strategy[8] was approved, which aims to achieve and maintain good environmental status of the Baltic Sea until 2020. The main objectives include further development of environmental management, reduction

of the nutrients flow, reduction of pollution by dangerous substances and their impact mitigation, biodiversity conservation, reduction of adverse impacts from navigation and other economic activities. To ensure implementation of the objectives of the Strategy, the Action Plan for the Baltic Sea Environment Protection Strategy for 2010-2015 was approved[9].

In 2011, a large part of municipal waste continued to be disposed of in landfills. Each year growing use of recycled waste has led to a decrease of about 2-3% in the waste disposed of in landfills. If, as expected, more municipal waste incineration plants are created then the amount of waste disposed to landfills might be reduced up to 10-15%.

In 2012, the amendment of the Law on Waste Management [10] was passed in order to improve the management of municipal waste regulation. To foster prevention of pollution and waste in forests, parks and residential areas, environmental damage compensation rates were increased up to 10 times. The National Waste Prevention Programme 2014-2020[11] was adopted to promote sustainable consumption, rational use of resources and materials. This was then followed by the National Waste Management Plan for 2014-2020[12], which described waste management goals, objectives and measures, as well as guidelines for national and EU funding support for the sector.

In recent years, the number of extreme environmental incidents have declined to 1-2 incidents/year, while economic output has risen. In 2012, 19 decisions on proposed economic activity were adopted with none rejected. This could be associated with a decline in the number of potentially environmentally hazardous economic facilities and adequate operational control[1].

Country specific issues

Point source water pollution was significantly reduced by constructing new modern urban wastewater treatment facilities and reconstructing the outdated ones, but the impact of diffuse pollution on surface water bodies still remains an issue.

> Since 2013 damage to the environment (including biodiversity) would result in a stringent (tenfold) fine being applied. Data show that, e.g., coarse fishing offenses, compared with 2012, have decreased threefold. To ensure a decrease in environmental damage actions are underway to modernise the environmental supervision system.

After a preliminary flood risk assessment, flood hazard and risk maps have been prepared. They concentrate on evaluating areas which could be flooded by rivers or sea in coastal areas, and assess the potential flood-related adverse consequences for human health, environment, cultural heritage and economic activity.

In 2012, the University of Yale declared Lithuania as the country with the best forest protection and management system in the world, over a 15 year period. To maintain such a rating, challenges remain to ensure the sustainable use of forest resources.

Countries and regions

Luxembourg

Main themes and sectors addressed in the national State of Environment report

Luxembourg does not regularly publish reports on the state of the environment. One main report was published in 1993 and there have been only two subsequent publications containing environmental indicators, one in 1998[1] and one in 2003 [2].

This unenviable position led to the decision to produce a new indicator-based report on the state of the environment foreseen to be published in the course of 2015. This report will have a strong communication focus towards the general public and will be web-based only so that updates might regularly take place when new data are available.

Key findings of the State of Environment report

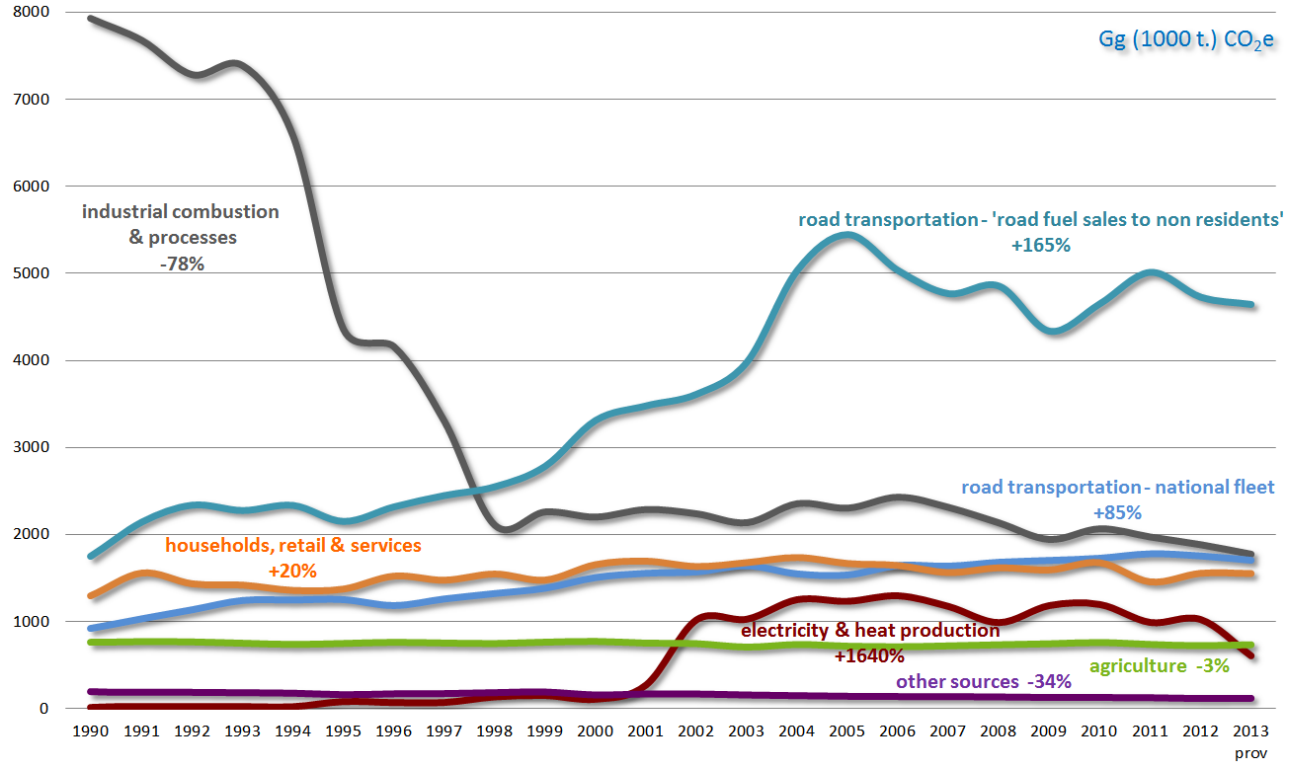
The **Second National Sustainable Development Plan** (NSDP2), finalised at the end of 2010 [3] comprises a list of "unsustainable trends" which are still valid as of today. With regard to the environment, these trends are touching upon two main topics: overuse of certain natural resources, including soil and land use on the one hand, and air, on the other. To that, water quality is another problematic issue that ought to be dealt with more stringent policies.

The economic development of Luxembourg these last 30 years has led to an **important growth** of both the **resident population** (40% increase over the last 20 years) and the **cross-border commuters** representing now almost 45% of the paid workers (a 250% increase over the last 20 years). This, in turn, has led to **increasing built-up areas** (housing, offices, services, infrastructures) and to **ever growing transport flows**, mainly by road. Population growth, coupled with the economic development in the tertiary sector, is a key driver of **urban sprawling** and **land fragmentation**[4]. Various actions are undertaken by the authorities to limit urban sprawl. However, the demographic pressure is leading to very high prices for construction (houses, apartments, land) that, in turn, generate social problems such as access to accommodation and the ability to pay. Consequently, there is also a wish for more building land in order to reduce prices.

All these developments have had, and still have,**negative impacts on biodiversity and on water quality**. But population and cross-border commuters growth is also leading to **rising energy demand**, both for buildings and for transport. Concerning the latter, although Luxembourg invests predominantly and jointly with the neighbouring regions in public transport in order to alter the current modal split of home-work journeys, a vast majority of workers from abroad still commute by car (86% of these journeys in 2010[5]).

Coupling these socio-demographic pressures with the location of Luxembourg at the heart of the main Western Europe transit routes for both goods and passengers, as well as with its policy of low road fuel prices, lead to **important impacts on air emissions** and, to a lesser extent, to **overall air quality**. **GHG emissions** from "road fuel sales to non-residents" have considerably increased since 1990 (+165% compared to +85% for the resident population, i.e. about 42% of the total GHG emissions, excluding LULUCF - i.e. emissions accounted for in the framework of the Kyoto Protocol and related engagements - and 75% of road fuel sales in 2013). At the same time, industrial emissions have reduced a lot since 1990, both due to technological changes and to the deindustrialisation of the country. See Figure 1 and references[6][7] for details.

Figure 1: Greenhouse gas emissions, 1990-2013



Note: figure excludes emissions due to land use, land-use change and forestry (LULUCF)

Source: MDDI

The issue of GHG emissions reduction is probably the most challenging issue Luxembourg has to face. Indeed, in the framework of the Effort Sharing Decision No 406/2009/EC (ESD), Luxembourg has the most ambitious national target of all the EU Member States for the non ETS sectors (transportation, housing, buildings, agriculture, waste): a 20% emissions cut until 2020 compared to 2005, i.e. 8.085 Mt CO_2eq.

The intensification of agricultural practices, urban and suburban development and an increased density of transportation infrastructure are the main driving forces affecting **biodiversity** in Luxembourg. While the overall status of biodiversity is still difficult to assess, national red lists, landscape statistics and monitoring of selected species often show negative trends. For instance, 74% of the species under the "Habitat" Directive are reported in the unfavourable or bad clusters, whereas this percentage is 59% for the species under the "Birds" Directive. Biodiversity-rich habitats such as wetlands, dry meadows and extensively used orchards have seriously declined over the past 30 years providing clear evidence of a rampant homogenisation of landscapes. Generally, biodiversity is in a better conservation status in forests than in open, predominantly agricultural and aquatic ecosystems.

In Luxembourg, at least 70% of **surface water** is likely to fall short of the EU's 2015 targets for chemical and biological quality as determined under the EU Water Framework Directive (WFD). With regard to **drinking water**, sources have not yet been protected, despite a legal obligation to do so dating back more than 15 years. According to the application of the Ground Water Directive, 2 of 5 **ground water** bodies are considered to be in poor qualitative status regarding nitrates and pesticides. Moreover, rural development policies have focused more on farm modernisation and the continued use of agricultural land than on the targeted protection of water resources.

The fact that cross-border commuters now represent 30% of the resident population is generating concerns in both the waste and waste water sectors: oversize investments with regard to population, high per capita ratios that do not necessarily reflect the average actual use by the resident population. The latter is often giving a **biased view of the country performance** when compared to other countries through benchmarking exercises.

Main policy responses to key environmental challenges and concerns

> Meeting the GHG emissions targets set for Luxembourg in the framework of the ESD is undoubtedly the biggest environmental challenge the country will have to cope with in the years to come, though NOx and NH_3 emissions reduction – which are somehow related to GHG ones with regard to driving forces and pressures – as well as freshwater and, to a minor extent, groundwater quality are also challenging in the coming years.

For **reducing substantively GHG emissions**, and considering that road transportation, and more precisely "road fuel sales to non-residents", is the main contributor to GHG emissions, Luxembourg will use a policy mix of instruments with the aim of **progressively reducing road transport related emissions** as underlined in the second national "**Action Plan for reducing CO_2 emissions**" adopted in May 2013[8]. To do so, the idea is to **gradually increase road fuels excise rates** following a cautious approach based on a better knowledge of the factors determining road fuel sales in Luxembourg that also takes into account the impact on the public finances of the country. Definitely, a long term planning of a gradual "decoupling" of road fuel sales revenues from public current expenditure is necessary.

With regard to other instruments, the Government considers the organization of transport and the necessity to overcome existing problems linked to traffic intensity as primary objectives. In this context, it intends to **promote sustainable ways of transport consisting of public and non-motorized modes of transport**. All this is intended to be done in a conceptual way where new modes of transport such as electro-mobility and car sharing are potentially promoted.

The main tool to achieve these transport-mobility related objectives is a **global strategy for sustainable mobility** ("MoDu" for "mobilité durable") of residents and cross-border commuters[9]. The planning approach developed in the framework of the "MoDu" strategy aims at reducing potential conflicts between transport planning and the environment, and seeks for synergies between a sustainable land planning and the development of transport infrastructures and offer. The 2020 target is a dual modal-split of 25% of daily trips by non-motorized traffic and 25% of motorized trips by public transport.

Buildings and houses are the second domain where GHG emissions could substantially be reduced. Numerous actions of the second national "Action Plan for reducing CO_2 emissions" target this sector and some of them are closely linked to measures foreseen in the **National Renewable Energy Action Plan** (NREAP)[10] and the **National Energy Efficiency Action Plan** (NEEAP)[11]. All these measures and policies should also have co-benefits for reaching air emissions goals set for the coming years (NOx for instance) and on pollutants concentrations.

Turning to **water issues**, Luxembourg will pay more attention to correctly transpose EU legal texts in its national legislation and deeply revise management plans as well as measures programmes so to reach the objectives set out by the WFD. Luxembourg expects to reach a 28% share of the surface water in "good ecological and chemical state" by 2015, 85% by 2021 and 99% by 2027. For groundwater, it is more complicated to estimate when a "good quantitative and chemical state" would be reached.

Finally, on **biodiversity issues**, since most pressures seems to be the consequences of agricultural practices, it has been requested that the new Rural Development Plan better integrate environmental aspects so to reconcile agriculture and nature protection. These measures should also help Luxembourg to reach its target with regard to ammonia (NH_3) emissions in the coming years.

Country specific issues

Mitigating GHG emissions

The EU "Climate and Energy Package" adopted in 2008 and its subsequent developments currently under discussion (the "2030 package") will be highly challenging for Luxembourg. By 2020, the country should:

- (i) reduce GHG emissions by 20% below their 2005 level for the non ETS sectors;
- (ii) achieve an 11% share of renewable energy in all forms in total energy consumption; and
- (iii) achieve a 10% share of renewable energy in all forms in total transport.

With regard to "road fuel sales to non-residents", though price differences with neighbouring countries is reducing over time (notably, through increases in excises), it cannot be expected that they will be entirely offset in the coming years. Indeed, that would require aligning prices to those of the most expensive bordering country with a risk of reverse "fuel tourism" due to the size of Luxembourg. Moreover, such a policy will not lead to any substantial reduction of GHG emissions at the European level since "fuel tourism" related emissions are the smallest part of "road fuel sales to non-residents"[12].

Climate Agreement with municipalities - 'Pacte Climat'

The Climate Agreement with the municipalities was presented in October 2012 and entered into force on the 1st January 2013. It reinforces the role of municipalities in the fight against climate change through a legislative, technical and financial framework set up in order to promote action against climate change. The 'Pacte Climat' means that municipalities commit to implement a quality management system relating to their energy and climate policy as well as an energy management tool for their infrastructures and their equipment. In return they benefit from technical and financial support given by the Government. End 2014, 92 municipalities out of 106, representing 95% of the resident population, were engaged in the Agreement.

The 'SuperDrecksKëscht' Action: a success story in managing hazardous waste

The 'SuperDrecksKëscht' (SDK)[13] is a programme for managing problematic waste from households and for implementing waste management in the business sector based on the principles of prevention, reduction and recovery of waste and promotes a new commercial model based on the 'consumption-reconsumption' philosophy. In 2010, the SDK programme has been awarded 'best practice' by the European Commission.

Countries and regions

Malta

Main themes and sectors addressed in the national State of Environment report

Malta's State of the Environment Report[1] was last published in 2010. It comprised 11 chapters, and took a broader analytical approach than previous publications. The aim of this broader approach was to provide a better understanding of the key policies and legislative instruments in each area of environmental policy. The 2010 report also included a chapter on the relationship between the environment and economic activity, as well as a chapter on environmental health. In this way, the report expanded on the link between the environment and our daily lives. Other topics that featured in earlier publications were also included. The 11 chapters of the report focused on the following issues:

- Driving Forces
- Air
- Climate Change
- Land
- Fresh Water
- Coastal and Marine Environment
- Resources and Waste
- Biodiversity
- Health and the Environment
- Economic Activity and the Environment
- Policy Responses

The State of the Environment Report is also supplemented by yearly Indicator Reports, providing updates of key environmental indicators.

Key findings of the State of Environment report

The report showed that greenhouse gas emissions[2] in Malta have risen in the past 25 years, contributing to climate change. Greenhouse gas emissions from the energy, transport, and waste sectors rose by 49% from 1990 to 2007. However, emissions per unit of GDP fell by 18% over the same period, as Malta decoupled its economic activity from emissions generation.

Air quality remains a concern in Malta. Concentrations of PM10 [3], nitrogen oxide[4] and ground-level ozone[5] exceed EU limit values in certain areas. Ozone concentrations are mainly caused by transboundary transport from outside Malta. However, concentrations of particulate matter and nitrogen oxides are chiefly the result of domestic emissions from traffic, and to a lesser extent, power generation. Demand for fuel from these sectors is expected to continue to increase. Associated impacts from air pollution may also continue to rise due to increasing numbers of private vehicles[6] and the high percentage of imports of older, more polluting vehicles.

On the positive side, Malta recorded a 38% fall in national annual average sulphur-dioxide concentrations[7] between 2004-2007. This fall may be the result of greater use of low-sulphur fuels.

Considerable pressure on Malta's coastal and marine environment arise from housing, waste generation, shipping, tourism[8], recreation, aquaculture, and fisheries. On a positive note, Malta's bathing waters[9] were 99% compliant with EU bathing-water standards in 2008, an achievement driven by improved beach management and pride in the Blue Flag certification.

The total amount of waste generated in Malta fell by 34% between 2008 and 2012. The amount of municipal waste recycled increased by an average of 8 percentage points during the last three years. However, with 82% of total municipal waste generated still being landfilled, Malta cannot be considered resource-efficient in this respect. In 2011, 593 kg of municipal waste was generated per person, a decrease of 1% from the previous year, but still high in comparison to the EU average, which was 503 kg/person in the same year. Waste prevention and waste minimisation are priority policy areas for the Maltese government[10].

The report also identified agriculture as having a significant effect on the Maltese environment, in spite of its relatively small contribution to national GDP. Agriculture is also the main user of groundwater, considered to be one of Malta's most limited and most over-exploited resources. Related unauthorised water abstraction and resulting salt-water intrusion are not the only threat. Nitrates[11] in groundwater bodies are also a major concern, with two thirds of pumping stations exceeding the EU limit value of 50mg/l in 2007, even though nitrate concentrations declined marginally between 2000 and 2007.

Another sector that places stress on the environment is tourism, one of the most important economic sectors in Malta. Between 2004 and 2008, the number of daily tourists in August increased by 4.9%. Catering for a competitive tourism industry has meant an increase in consumption of resources, pressures on ecologically sensitive areas, increases in waste generation, and increases in land take for infrastructure.

By the end of 2008, just over one fifth of Malta's land area was legally protected[12] and 13% formed part of the Natura 2000 network[13]. These sites are considered 93% sufficient in affording protection to terrestrial habitats and species[14] of community interest. Management of protected areas is helped by EU Structural Funds.

Main policy responses to key environmental challenges and concerns

Malta has made significant progress in upgrading its environmental policy capacity. However, the public and private sectors still need to devote greater financial and human resources to improve the country's institutional capacity and infrastructure.

Government environmental expenditure amounted to €81.8 million in 2007, up 31% from the 2004 level, and equivalent to 1.5% of GDP. Waste management, including wastewater treatment, absorbed almost 90% of this expenditure. Green jobs account for approximately 2% of GDP and between 2.5% and 3% of Malta's employment, and are principally to be found in the waste management and water sectors.

Environmental policy continues to rise in importance on the national agenda, with 54 pieces of legislation concerning the environment adopted between 2005 and 2008. Public opinion polls continue to indicate high levels of concern about environmental issues, yet this level of concern is often not translated into individual action. Malta has identified the need for a national environmental education policy to make environmental education mandatory in the national curriculum.

With some 50 economic instruments related to the environment, Malta is currently making notable use of environmental-economic instruments, but with varying degrees of success. A more coherent approach within the country's overall environmental management strategy is recommended. There is still significant potential for the use of voluntary schemes by business and public organisations. These schemes could be improved if organisations were

incentivised to apply for them, and if they received active technical support. On similar lines, the current level of Green Public Procurement (GPP) is negligible, pointing to the need for a National Action Plan for GPP.

Country specific issues

Malta is now focusing on a number of environmental priorities.

Malta is working to changing its **highly seasonal tourism industry** in order to spread tourist flow throughout the year. This will result in less pressure on natural resources in peak seasons and more efficient use of resources in the shoulder months.

There is an urgent need to improve **waste management**. The State of the Environment report advocates the use of educational campaigns to help achieve the 50% recycling target for household paper/board, glass, metal and plastic waste. In addition to public campaigns, there is also a need to improve waste-treatment infrastructure.

Water demand management is another priority, and will help to reduce wastage and raise efficiency levels. In particular, private water supplies need to be billed[15] to achieve the wider goal of sustainability. Obstacles preventing the re-use of treated effluent must be addressed and supported by more environmentally sustainable, improved and innovative management of urban and rural run-off water.

Malta aims to reduce impacts from **air pollution and climate change** by reducing energy consumption and by decoupling energy demand from economic growth.

Reducing the environmental impact of agriculture is also critical. Malta is working to promote sustainable farming practices that take into account the broader goals of rural development policy. Integrating agriculture and rural development policy in this way will help to address threats such as land abandonment, contamination of soil, illegal dumping, and inappropriate sitting and design of rural buildings.

Malta aims to improve the management of **Marine Protected Areas** to ensure that coastal habitats and species of ecological importance are protected. This work is part of a national vision for the country's marine areas, which integrates environmental protection with the sustainable use of coastal and marine environments.

Countries and regions

Montenegro

Main themes and sectors addressed in the national State of Environment report

According to the Law on the Environment[1], the Environmental Protection Agency (EPA) is responsible for preparation of environmental reports and contributions to international requests via the following publications:

- National Information on SoE – annually,[2]
- Indicator-based SOER – every four years.[3]

The **Law on the Environment** stipulates mandatory drafting of a SOER of Montenegro for a period of four years, based on the **National List of Environmental Indicators** which was adopted by the Government on March 2013. Consequently, the EPA published the first indicator-based SOER to present information to decision makers and the general public in Montenegro.

The report addresses the following themes and sectors:

- air,
- water,
- climate change,
- agriculture,
- energy,
- tourism,
- transport,
- fisheries,
- waste,
- biodiversity,
- marine ecosystem.

The indicator's position in the internationally applied DPSIR model is specified.

An indicator-based SOER uses information and analysis from many years of implementation of monitoring programs for all segments of the environment (which are conducted by the institutions selected in the tender procedure), in addition to data obtained from relevant national institutions.

Key findings of the State of Environment report

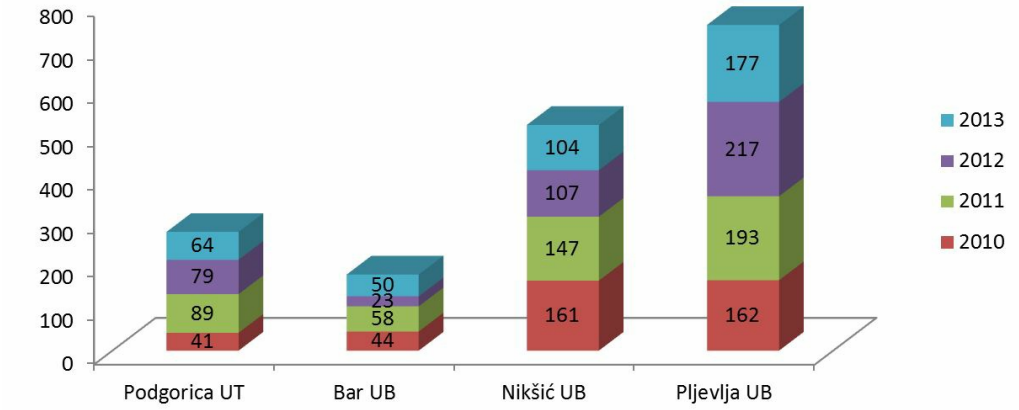
During the period of sanctions (1990-1995), there was a significant drop in **emissions of acidifying substances** - primarily of SO_X and NO_X - due to the overall reduction in economic activities (primarily in energy production and transport intensity). After 1995, SO_X and NO_X emissions showed a steady upward trend. For the NO_X emissions this stabilised for in 2009 (around the base value of 1990), while the SO_X emissions trend remained unstable. This was probably a result of changes in the energy sector which was particularly pronounced in 2009; a decline was observed in SO_X emissions by almost 50% compared to 2008. With intensifying energy production in 2010, emission levels

suddenly increased. In the same reporting period - due to a drop in agricultural production - emissions of NH_3 showed a stable trend of slight decline, and in 2010 emissions amounted to about 50% of the 1990 levels.

Concerning the sectoral emissions of SO_X and NO_X during the period 2006-2010, there was a trend of increasing participation of the energy sector in total emissions (SO_X by 18%, NO_X by 7%), a significant reduction in emissions from energy use in industry (SO_X by 28%, NO_X by 24%) and the share of transport (about 30% and about 15%). There was an increase of NO_X emissions (about 15%) by public sector services, institutions and households.

Air quality in urban areas and nationwide assessed in terms of the concentration of SO_2, NO_2 and O_3 is within the prescribed threshold limit value, with no major concentration variations on an annual basis. High concentrations of PM_{10} and a large number of exceeded permitted daily concentrations (Figure 1) were most pronounced during the heating season, mainly due to the use of solid fuels (coal and wood).

Figure 1: Number of exceedances of daily limit values of PM_{10} particles



Source: Environment Protection Agency

Total **consumption of ozone depleting substances** (ODSs) was 37.22 t in 2006 and 17.14 t in 2012. This represents a 54% decrease in the consumption of ODSs, mainly in the refrigeration sector. This results from **National Program for the Elimination of ODSs (2007),** but importantly, there is no domestic production of ODSs. Compared with the 105.6 t baseline consumption of ODSs (1995-1997), the decrease is 84%.

As a clear consequence of the crisis in the early 1990s, **GHG emissions** were reduced by over 50% in a five-year period. However, in 1998, emissions reached the same level as 1990, the baseline year. In the period 1998-2008, there was an evidently growing trend as a result of energy consumption in all energy sub-sectors except for industry activities. As a result of the global economic crisis, a new decline in industrial production and consumption of energy caused the decrease of GHG emissions in 2010 to a level of 22% below the baseline year emissions.

With regard to the **Water Quality** Index, in 2012 about 45% of the 13 monitored rivers were in the good quality category, 30% were very good and 25% were bad. Compared to the previous year, the average annual value of nitrate concentrations decreased in all streams with lower spatial imbalances. In contrast, the concentration of orthophosphate significantly varies spatially. In the period 2009-2012, there was a decrease in the concentration of BOD5 by 18% and a decline in concentration of NH_4 ions by 43%.

Organic production is becoming more popular and economically important. Although in 2011 the area under organic farming covered 0.6% of the total agricultural land, in the period 2007-2011 the number of registered organic producers increased from 13 to 100.

In the period 2009-2012, the amount of **generated municipal waste** was reduced by 39% while the GDP increased by 3.5%.

The national network of **designated areas** covers 9% of the national territory of which the largest part (7.8%) consists of 5 national parks. The remaining part covers more than 45 protected areas in the following categories: natural monument, an area of unique natural features and (general and specific) reserves. The planned target in the **National Biodiversity Strategy** is 10% of the terrestrial territory and 10% of the marine area.

Main policy responses to key environmental challenges and concerns

Montenegro is in the process of EU integration with gradual adoption and implementation of EU legislation. Improvements in the field of air protection are connected with adoption of the following new legislation:

- Law on air protection;[4]
- Regulation on the limitation of emissions of air pollutants from stationary sources; [5]
- Regulation on the establishment of a network of measurement points for monitoring air quality; [6]
- Regulation on the types of pollutants, limit values and other air quality standards;[7]

all fully harmonized with EU legislation.

From 1 January 2011, the use of motor gasoline with additives based on lead and regulate the sulfur content of liquid fuels of petroleum origin was prohibited under the **Regulation on limit values of pollutants in liquid fuels of petroleum origin**[8], in accordance with EU regulations.

The first **National Strategy on Air Quality Management (2013-2016)**[9] has been adopted together with 54 measures in the Action plan framework. In accordance with national legislation (and EU directive 2008/50 EC), Air Quality Plans for two cities with the highest level of PM_{10} concentrations exceedances have been adopted.

Efforts to create a national legal framework in the area of **climate change** is still ongoing. Concrete steps in implementing the Montreal Protocol, were made in 2007 with the adoption of the **National Program for the Elimination of Ozone Depleting Substances** and the **Plan for the Ultimate Elimination of CFC Substances**. The deadline for the final elimination of CFC substances (consumption or import) was on 1 January 2010. In addition, the purpose of the adoption of the Plan is to gradually eliminate the consumption of HCFC substances, especially in the service sector. The baseline period (from which the reduction of demand for HCFC substances is accounted for) is the period 2009-2010.[10]

Only 64% of all recommendations from the Water Framework Directive have been transferred into national legislation. The revision of the **Law on waters** is ongoing.

The new **National Strategy** and **National Plan on Waste Management (2014-2019)** are drafted but still in the process of being adopted. The goal is harmonisation with Waste Framework Directive requirements for reuse and recycling, support to the **Strategy on Energetic Development of Montenegro** till 2030, as well as support and inputs to the **National Environmental Approximation Strategy**.

The ongoing process of updating the 2010 **National Biodiversity Strategy** (NBS) and the Action Plan (expected to be completed by the end of 2014)[11] will enable full integration of the **Aichi Biodiversity Targets** into the national strategic framework and alignment with the **Strategic Plan for Biodiversity 2011-2020.** The NBS and the **National Strategy for Sustainable Development** established the objective of extending protected nature areas to 10% of the terrestrial territory and to protect 10% of the marine area. The first goal will be achieved in upcoming period with the proclamation of two new protected regional parks. With the purpose of achieving a higher level of harmonisation of national legislation with the Habitat and Birds Directive, the revision of the **Law on nature protection** was adopted at the end of 2013.

Country specific issues

The development of the **Coastal Area Management Program** (CAMP)[12] for Montenegro is considered one of the most significant national success stories. This project was implemented by the **Mediterranean Action Plan -** in the scope of UNEP and Montenegrin Ministry of Sustainable Development and Tourism - with the involvement of local governments from the project area and relevant institutions such as Environmental Protection Agency (from 2012).

Another important activity is the assessment of general vulnerability based on the vulnerability of individual environmental segments. Existing pollution of individual environmental segments were analysed as a specific characteristic. Results of the assessment served as one of the baselines for defining spatial vulnerability and for identifying remediation measures. Vulnerability assessments or the determination of sensitivity/susceptibility of space is a method used to determine more vulnerable (unsuitable) spatial segments for the given (planned) intervention or activity. It represents an innovative tool for policy decision makers.

An assessment of general vulnerability is not an independent assessment per se – it is rather a baseline for preparation of the **Coastal Area Spatial Plan** as well as for the **Strategy and Plan for Integrated Coastal Zone Management.**

Countries and regions

The Netherlands

In its Assessment of the Human Environment 2012[1][2], the PBL Netherlands Environmental Assessment Agency evaluates national government policy for the physical human environment and presents options for making improvements to this policy. This biannual report are published on the basis of the Article 4.2 of the Environmental Management Act. Supplementary up-to-date facts and figures about the environment, nature and spatial developments are provided on the Environmental Data Compendium website[3].

Quality of the human environment

In the Netherlands the quality of the local human environment has improved in recent decades. This is in contrast with the persistent issues the Netherlands faces around global human environmental quality, such as climate change and maintaining biodiversity. The high level of dependence on imported raw materials is also a concern.

Human environment shows significant improvements

> Pressures from the environment decreased significantly between 1990 and 2010, or, in the case of greenhouse gas emissions, remained more or less stable. At the same time, gross domestic product increased by over 50%. Therefore, the Netherlands has succeeded in uncoupling economic growth from environmental pressure.

Regarding the human environment the following trends can be observed:

- For greenhouse gas emissions the Netherlands adheres to its Kyoto commitment.
- The emission of hazardous substances to the air has decreased significantly since 1990. The European emission ceilings for sulfur dioxide, ammonia and volatile organic compounds are not being exceeded. The emission of nitrogen oxides roughly equals the target.
- The annual average concentrations for most air pollutants, such as particulate matter and nitrogen dioxide, show a long-term decline. In most parts of the Netherlands these concentrations are below their limit values. However, locally there are still health effects due to poor air quality, particularly near busy roads
- Surface water quality has improved considerably both chemically (nutrients, pesticides) and ecologically. However, the ecological quality of surface waters does not meet the objectives of the Water Framework Directive. Roughly half of rivers, drainage ditches and lakes have too high concentrations of nitrogen and phosphates as a result of over-fertilization in agricultural areas
- The Dutch water safety policy of the past decades has contributed to much better protection against flooding in high-risk areas. However, due to population growth, increased prosperity the water security policy task has increased. The overall result is that despite ongoing investments, in 2011, one third of the primary dykes and one fifth of the coastal defenses do not meet national standards
- Biodiversity has steadily declined during the past century. In the last years, this decline has been gradually slowing down. Decreasing over-fertilization and acidification have had positive effects on the loss of biodiversity. Due to expansion of nature areas land available to plant and animal species is increasing. Outside the nature areas, however, biodiversity still continues to show strong decline. Overall, biodiversity loss has slowed, but not stopped

Persistent global issues require systemic changes

The challenge in the coming years is to change production and consumption systems making more efficient use of natural resources while keeping hazardous emissions to a minimum[4][5]. In some cases this can be achieved by intensifying policy; at other times a more fundamental change of approach is required. This requires systemic changes; institutional reforms that help achieve a high-quality human environment without undermining the natural constraints, either in the Netherlands or elsewhere.

The challenges of the 21st century require a new approach

The environmental and sustainability challenges of the 21st century require a modern approach. Combating climate change, maintaining biodiversity and aiming for a circular economy require streamlining of legislation, active involvement of many parties and active international cooperation.

In 2014 the Dutch Government announced it would modernize its environmental policy, utilizing the energy that the public, companies and other authorities have in the field of environment and sustainability and retaining a safe and healthy living environment. This policy focuses on public health and also formulates an approach staying ahead of new environmental related health problems linked to the introduction of new substances in the environment[6].

Air quality and noise nuisance are linked environmental issues that still need attention. Measures to improve the environment in this respect include the reduction of transport emissions by making agreements at the appropriate European, national, provincial or local level; car-free urban areas; and stimulating people to use zero emission forms of transport like bicycling.

Finding answers to current and new problems is not only a task for the authorities. Initiatives of civil society organizations, market parties, as well as critical and involved citizens contribute to a sustainable society in which we can live, work and enjoy leisure activities in a safe, healthy and pleasant way.

International cooperation is becoming increasingly important in the environmental and sustainability domain. After all, air- and water pollution and environment related crime do not stop at borders and companies operate across borders far more often than in the past.

In addition to working actively at the international level legislation and regulations are updated in a new Environment Act giving the powers to the layer of government that can best solve particular environmental problems. The new Act will replace about 114 Orders in Council, some 100 of which have to do with the broad terrain of the environment.

Together with other member states the Netherlands would like to identify options for improvement and investigate with the European Commission how these options can be implemented. Examples are the planned revisions of existing regulations within the framework of the Commission's Regulatory Fitness and Performance programme (REFIT).

Energetic Society

The Dutch Government faces several challenges to achieve a sustainable human environment. At the same time it has much to gain from a better utilization of its citizens' creativity and innovation potential in an 'energetic society'[7]. By combining the mindset of 'green growth' with 'the energetic society', a new perspective is created on the role of government: one that considers the long term and that creates opportunities for a sustainable society.

An example of this approach is the 'Energy Agreement for Sustainable Growth'[8]. This agreement aims at achieving, within an international context, a wholly sustainable energy supply system by 2050. The Energy Agreement also aims to strengthen the economic structure and to contribute to future sustainable growth, by (re)investing in more energy-efficient products, production technologies and renewable energy. With this agreement more than forty organizations

have laid the basis for an energy and climate policy enjoying broad support. These organizations include central, regional and local government, energy producers, financial institutions and civil-society organizations like employers' associations, unions, nature- and environmental organizations.

Green economy

There is rapid growth in global markets for clean and efficient products. Opportunities may lead to benefits if the Netherlands makes use of its innovative power, current economic structure and comparative advantages. While in the same time restricting the dependence on imported raw materials. There are at least three promising themes for the transition towards a greener economy: the bio-based economy, the sustainable built environment and the circular economy.

In each of these areas, the Netherlands has a strong knowledge base. In the area of the sustainable built environment, this is true for lightning technology and energy saving. Dutch architects and designers enjoy international recognition for their innovation and imagination. In the bio-based economy, the Netherlands also enjoys a strong comparative advantage. A green economy cannot be achieved by the business community alone; the government also has a clear role to play.

Investing now in innovation and a green growth strategy, will provide dividends later on. To support the transition towards a green economy the Dutch Government will take its role as 'launching customer'. Moreover, the government will review the effectiveness of a broad set of fiscal and financial incentives to promote the green economy and work in an international setting to help the sustainable economy move forward. So-called "Green Deals", engaging a broad coalition of stakeholders, are used to overcome boundaries currently blocking green developments. Another ambition is to remove laws and regulations obstructing entrepreneurs in making their production processes circular. On a strategic level the Netherlands aims by 2020 to be a hotspot of the circular economy where new social and economic processes go hand in hand with innovative technology and production processes.

Countries and regions

Norway

Main themes and sectors addressed in the national State of Environment report

State of the Environment Norway [1] is a website that aims to provide online information about the latest state of – and developments in – Norway's environment. SOE Norway is used to compile the country's national State of the Environment report. The Ministry of Climate and Environment has assigned the production of SOE Norway to the environmental authorities[2]. The Norwegian Environment Agency has the overall editorial responsibility for the website.

SOE Norway addresses the following main environmental themes:

- Waste,
- Hazardous chemicals,
- Freshwater,
- Outdoor recreation,
- Marine areas,
- Climate,
- Cultural heritage,
- Air pollution,
- Polar regions,
- Biodiversity,
- Radiation, and
- Noise.

These all have a separate thematic approach, with indicator-based assessments and data reflecting the state of environment. An updated national indicator catalogue was made available online in 2014. A major objective of environment.no is to create an understanding of the relationships between environmental conditions, what affects these relationships, and the need for measures to improve the state of the environment.

Key findings of the State of Environment report

> In general, the state of the environment in Norway is improving. For instance, there are positive trends in water quality, air quality and waste management. But hazardous substances are becoming more widely dispersed in the environment, and are found in more and more species.

Biodiversity is under pressure in Norway as well as other parts of the world. Major environmental pressures in Norway in the years to come are likely to include a continued trend towards urbanisation, increased energy demand, and an increase in the rate of climate change.

Climate change: Norwegian greenhouse gas emissions rose by around 5% from 1990 to 2013. A long-term trend of a rise in total emissions towards 2020 is expected, unless new measures are implemented. Many changes caused by climate change have already been observed in the Norwegian natural environment. CO_2 emissions rose by 27% from 1990-2013, mostly due to increased oil and gas production, but from 2010-2013 CO_2 emissions have slightly decreased (down 2,9%).

Biodiversity: In the past 100–150 years, human activities have resulted in far-reaching changes in Norwegian nature. Changes in land use are among the greatest threats to biological diversity. Local variability in habitats and species composition is being reduced, and some species are being wiped out. Almost 4 000 species are on the current Norwegian Red List, and half of these are threatened. Invasive alien species also cause harm to local fauna and flora. The extent of areas without major infrastructure development, including wilderness-like areas, is shrinking steadily. For the country as a whole, the proportion of wilderness-like areas has dropped from 48% to less than 12% in the past 100 years.

Fresh water: Norway's rivers and lakes provide a rich freshwater environment, which is under less pressure from human activity than many countries in Europe. Challenges still remain as many rivers and lakes are altered due to hydropower regulation, urbanisation, and roads. Around 25% of Norway's water courses are at risk of not obtaining good ecological and chemical status in 2015. Long-range transboundary pollution causes acidification and brings hazardous substances to lakes and rivers.

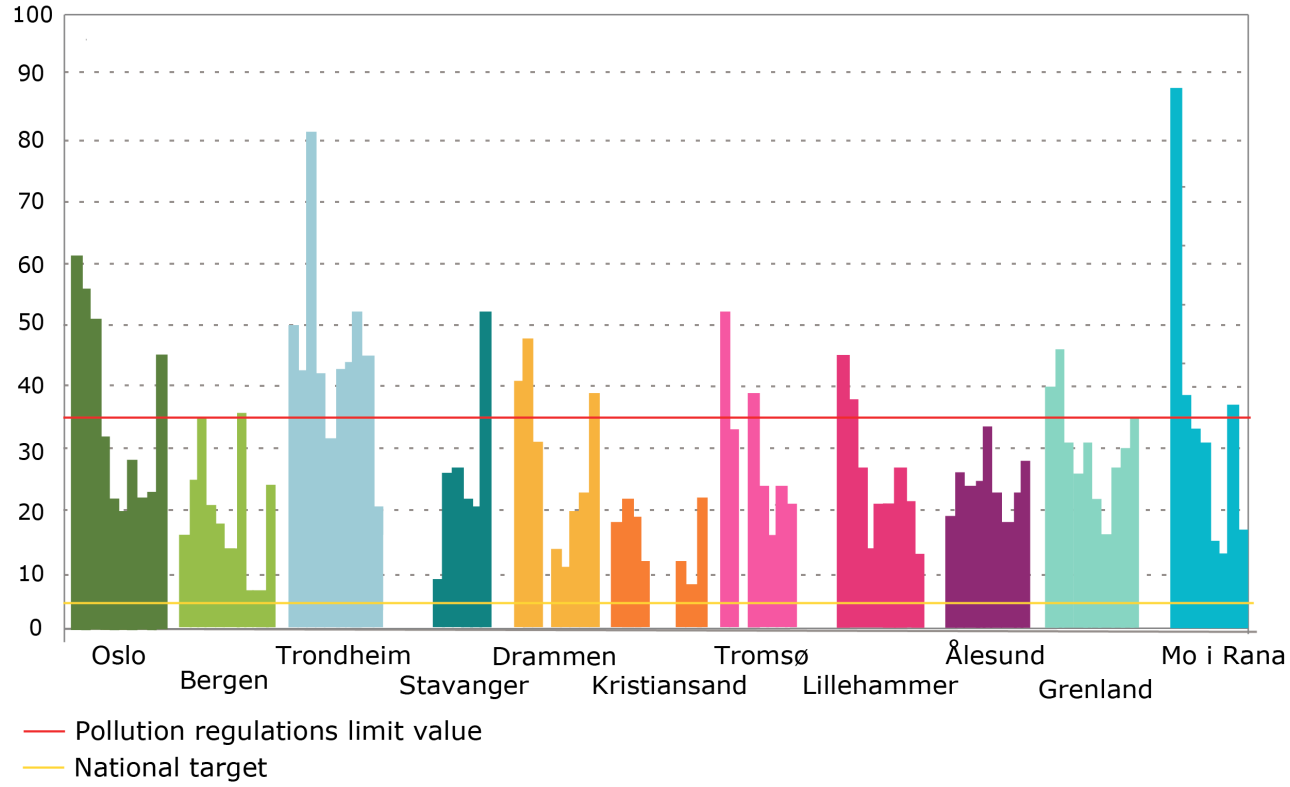
Air quality: Air quality in Norway generally has improved since the 1990s. However, many people in the larger towns are still affected by local air pollution, and some limit values are still exceeded every winter. In Norway, between 500 and 2 000 people die prematurely every year because of air pollution. Children and the old are the most vulnerable. In the largest towns, current knowledge indicates that particulate matter and nitrogen dioxide pose the most serious risks to health, and result in a higher frequency of various types of respiratory problems.

Waste: In Norway, waste volumes have increased by almost 40% since 1995. As much as 87% of non-hazardous waste is recovered, and 95% of hazardous waste is collected. Pollutant releases from waste treatment have been reduced in recent years. Economic growth is one reason for the rising quantities of waste.

Marine Areas: Norway's marine areas are rich in resources and biodiversity. Pressures on these resources and biodiversity come directly from human activities such as aquaculture, extensive fishing, and oil and gas production. Other indirect pressures include climate change and ocean acidification. The Norwegian government is therefore developing integrated marine management plans for all Norwegian marine areas. Many coastal areas and fjords are contaminated by hazardous substances from present and previous industrial activity and dumping. Reductions in emissions of hazardous substances – and the clean-up of contaminated marine sediments – have resulted in improvements in the state of the environment in several places.

Noise: Noise is the environmental problem that affects the largest number of people in Norway. Nearly 1.4 million people are exposed to noise levels above 55 dBA outside their home. The number has increased by a quarter of a million since 1999. Sleep disturbance due to noise affects 200 000 people in Norway.

Figure 1. Number of exeedances of PM_{10} target levels in urban areas, 2004-2013



Source: Central Database for Air Quality Data, 2014; environment.no

Main policy responses to key environmental challenges and concerns

Climate change and the transition towards a green and sustainable society are amongst the main challenges and environmental concerns in a wider and cross-sectoral context in Norway.

The objectives and principles of Norwegian climate policy are anchored in the broad political agreement reached in the Norwegian parliament between 2008 and 2012[3] and updated by a white paper on Norwegian climate policy[4] and Norway's sixth National Communication under the Framework Convention on Climate Change[5]. The climate agreement includes measures and checkpoints for following up on the climate policy. Among other things, the agreement refers to sector-specific climate-action plans and targets for individual sectors. Climate-change adaptation is also a growing concern in Norway and has been addressed through the white paper "Adapting to a changing climate - Norway's vulnerability and the need to adapt to the impacts of climate change"[6].

Sustainability should be a fundamental principle for all development in Norway. The government's strategy on sustainable development (presented to the parliament in the national budget for 2008) and the latest Nordic strategy "A Good Life in a Sustainable Nordic Region" (2013)[7], confirms that a policy for sustainable development must be based on the principles of equitable distribution, international solidarity, the precautionary principle, the polluter-pays principle, and the principle of common commitment.

In Norway, there is an increased awareness around the value of ecosystem services and their connection with sustainability. Adequate knowledge about the state of ecosystems and their ability to deliver services (and how human activities affect this ability) is a necessary precondition for good nature management.

Country specific issues

Cities of the Future[8] is an example of an innovative approach supporting the long-term transition towards a more sustainable Norwegian society. Cities of the Future was a collaboration between the government and the 13 largest cities in Norway to reduce greenhouse gas emissions and make the country's cities better places to live. The programme ran from 2008–2014.

The programme has helped city municipalities to share their climate-friendly city development ideas with each other, with the business sector, with the regions, and with the government. By including the 13 largest cities in Norway, Cities of the Future included almost half the country's population.

Reduced greenhouse gas emissions were the main goal of the project. Its main focus areas were land use and transport, consumption and waste, energy and buildings, and climate-change adaptation. An improved urban environment and cooperation between cities and businesses were secondary goals of Cities of the Future.

The programme identified specific projects and actions that could lead to structural changes. Reduced pollution and an improved urban environment can, for example, be achieved by building more densely, and by enabling people to walk and cycle instead of using cars. Fewer cars and roads will make more room for bike paths and parks. The parks will also help to absorb the increasing rainfall expected in the future, and at the same time create greener and more pleasant cities. Infrastructure for public transportation must be included when planning for new living areas or business areas.

The website miljokommune.no[9] is another project that aims to improve municipal commitment to the environment by providing guidance and advice to local authorities in relation to environmental issues.

Countries and regions

Poland

Main themes and sectors addressed in the national State of Environment report

The purpose of the State of Environment (SoE) [1] report is to present objective information about the state of environment in Poland for decision-makers and the general public. The Chief Inspector for Environmental Protection is obliged by law to prepare a SoE report at least every four years[2]. The report should consider in particular data from the State Environmental Monitoring (SEM)[3]. The general structure of the report refers to priorities identified in national environmental policies[4].

The report addresses the following environmental issues: resource use and waste, biodiversity and forests, air pollution, water quality, noise, electromagnetic fields, ionizing radiation, ozone layer and climate change. Each chapter begins with information about the state of the environment followed by drivers and pressures and their impacts.

Key findings of the State of Environment report

> Over the previous two decades Poland has made significant progress in the area of environmental protection and reduced the pressure on the environment. Despite such successes some problems remain.

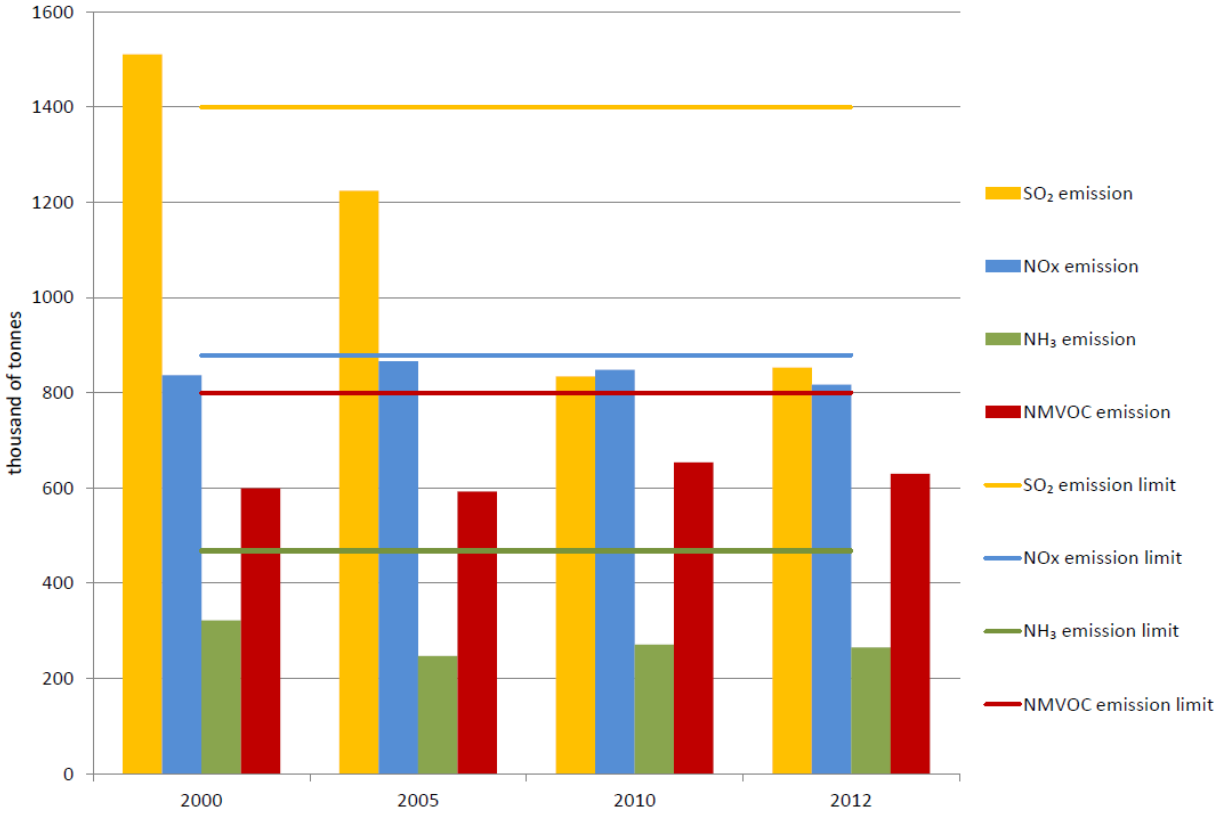
Poland remains one of the most **material**- and **energy**-consuming economies of the European Union (EU) in terms of efficiency. The rate of increase in final energy use is much lower than the rate of increase in GDP[5]. Domestic material consumption has been growing intensively in correlation with economic growth[6]. The latter results mainly from the use of non-metallic materials for infrastructure projects.

For the last decade the total amount of **industrial waste** has remained at a relatively similar level. Its main source is mining, quarrying and manufacturing. Since the mid-2000s the amount of municipal waste generated has been slightly decreasing and has now reached 314 kg per capita (2012). The use of landfill sites remains the main method of municipal waste disposal[6].

Poland achieved and maintains valid national emission ceilings for **air pollutants** (Fig. 1). Continuous development of the Polish economy in the last two decades has not led to increased emissions, and in some cases a systemic reduction has been observed (sulphur dioxide).

In spite of the improvement of **air quality** in Poland, exceedances of target value for tropospheric ozone in the summer season and exceedances of limit values for PM_{10}, $PM_{2,5}$ and benzo(a)pyrene in the winter season remain a serious problem. The latter is particularly related to emission from domestic heating for households and obsolete transport options[9].

Figure 1. Emissions volumes compared with national emission limits for 2010



Note: Figure shows substances stated in the Treaty of Accession of the Republic of Poland to the EU, in the scope of the National Emissions Ceilings Directive 2001/81/EC[7]

Source: Ministry of the Environment, National Centre for Emission Management [8]

The **pressure on water resources** has been decreasing. Since the early 2000s, water abstraction has reminded stable. Municipal waste water discharges decreased by 12% whilst the percentage of the population able to benefit from waste water treatment plants increased from 53% in 2000 to 68.5% in 2012. After a significant reduction in the early 1990s, the use of mineral fertilizers stabilized in the mid 2000s. There was, nevertheless, a slight increase in nitrogen fertilizers beween mid 2000s and now (2012)[6]. The negative impact from various industrial sources was limited as well.

As a result of action taken in the area of water management, **nitrogen and phosphorus discharges** flowing through rivers in Poland to the Baltic Sea have decreased. Nevertheless the **quality of surface water** in some areas is insufficient. The chemical status of **groundwater** is good in 80% of measurement points covered by SEM.

A steep increase in the number of cars since the beginning of this century has resulted in an increase in a **traffic noise** from roads. According to noise maps prepared for agglomerations under the 2002/49/EC directive[10] about three million inhabitants are exposed to exceedances of noise limits for the day-evening-night time period and two million for the night time period alone.

Despite disadvantages of the current structure of fuel consumption (over 50% of total primary energy consumption is from coal), during the period 1988-2012 Poland managed to reduce **GHG emissions** by almost 29% and met its Kyoto protocol[11] requirements with a surplus of 24%[12].

At the same time the country is characterized by an exceptionally rich **nature and landscape**. The fact that Poland is a natural habitat for rare species on Europe-wide scale, makes it particularly responsible for the protection of natural heritage. 32.5% of the territory of Poland is protected in one way or another, usually related to natural or scenic importance. **Forest cover** has been permanently increasing since the mid 1990s and reached 29.3% of the country's territory in 2012[6].

Main policy responses to key environmental challenges and concerns

Poland has undergone constant and intensive economic growth during the last two decades. Therefore one of the major challenges is to achieve sustainable development through such growth and environmental protection requirements.

Reflections on the **green economy** are included, *inter alia*, in the following documents:

- National Development Strategy 2020[13] based on a sustainable development scenario;
- Energy security and the environment strategy – 2020 perspective[14] - interlinks quality of life and state of environment with the sustainable development of the energy sector, the energy security of Poland as well as the effectiveness and competitiveness of the Polish economy;
- National Programme for the Development of Low-Emission Economy[15] - aims to support improvement of energy- and resource-efficiency, waste prevention and better waste management, and promotion of new consumption patterns.

National Waste Management Plan 2014 specifies objectives and measures in this area[16]. Waste management plans are also elaborated for 16 voivodeships (regions). The national waste prevention programme was adopted in 2014[17].

The National Fund for Environmental Protection and Water Management launched a nationwide programme (KAWKA) dedicated to problems of emissions from individual heating for households. It financially supports initiatives aiming to reduce emission in residential areas, increase energy-efficiency and develop diffused energy sources. It will help to achieve air quality standards and limit exposure to air pollution[18].

Achieving **good status of water** is supported by various documents including, *inter alia*, 10 water management plans[19], the Water and Environment Programme[20], and the National Programme for Municipal Waste Water Treatment[21]. Limiting the impact on water resources from agriculture is supported by various rural development programmes[22] aiming to reduce nutrient loads in freshwater bodies and the sustainable use of fertilizers.

The Polish National Strategy for Adaptation to Climate Change by 2020 aims to ensure sustainable development and the efficient functioning of the economy and society in a changing climate. The document specifies objectives and adaptation measures to be taken in the most vulnerable sectors and areas: water management, agriculture, forestry, biodiversity and legally protected areas, health, energy, construction, transport, mountainous, coastal and urban areas[23].

Protecting biodiversity and the landscape is important. The national strategy for the protection and sustainable utilisation of biodiversity and The action plan for the period 2007-2013 aim to support this[24]. They will be amended to consider the Aichi Targets for the period 2014-2020.

Country specific issues

Sustainable development can be supported by investments in innovative projects, especially green and clean carbon technologies. Development of green technologies in Poland is supported, *inter alia*, by the following:

- **GreenEvo – Green Technologies Accelerator**[25] is an innovative project initiated and managed by the Ministry of the Environment. It promotes Polish environmental technologies and supports the development of this sector at home and abroad. Environmentally sound technologies are selected with a view to foreign export. Participation in the project offers companies training and consulting services as well as support to meet the expectations of foreign contractors. So far 62 winners have been selected in 5 separate editions of the project. In 2013 overall sales from companies which have taken part in the project grew on average by 36%. Sales abroad increased by 50%. Meanwhile employment increased by 40%.
- Participation (on a voluntary basis) in an EU established **Environmental Technology Verification (ETV) pilot programme**[26]. This program is a new tool is to help innovative environmental technologies reach their target markets. The Institute of Technologies and Life Sciences from Poznań and the Institute of Environmental Protection - National Research Insitute operate as Polish verification bodies. The Ministry of the Environment is also looking to create instruments of support for entrepreneurs who wish to benefit from the ETV.

Countries and regions

Portugal

Over the last couple of decades, Portugal has made significant developments in environmental protection and quality of life improvement. Currently is developing a Commitment for Green Growth which aims to decouple economic growth from resource use, promote energy efficiency and the identification of new growth opportunities.

Main themes and sectors addressed in the national State of Environment report

The Portuguese State of the Environment Report (Relatório do Estado do Ambiente – REA or, in English, PT-SOER[1]) is published annually in compliance with the National Framework Environment Law[2]. The report assesses and discloses the country's environmental performance. The last report was published in December 2014 by the Portuguese Environment Agency (APA).

The PT-SOER 2014 considers 32 indicators covering seven thematic areas: Environment and Economy, Energy and Transport, Air and Climate, Water, Soil and Biodiversity, Waste, and Environmental Risks. The selected set of indicators used data provided by APA, as well as by many other national organisations.

The report describes the Portuguese social and macroeconomic framework, and makes a brief analysis of the relationship between recent trends in the Portuguese economy and some environmental variables. The PT-SOER 2014 also included, for the second time in its history, two quantified scenarios for possible evolutions of the Portuguese economy until 2050. As an innovation, the report comprised a chapter which explored the potential impacts for the country's environment of two of the Megatrends identified by the EEA in 2010 (and now updated): "Intensified global competition for resources" and "Increasingly severe consequences of climate change".

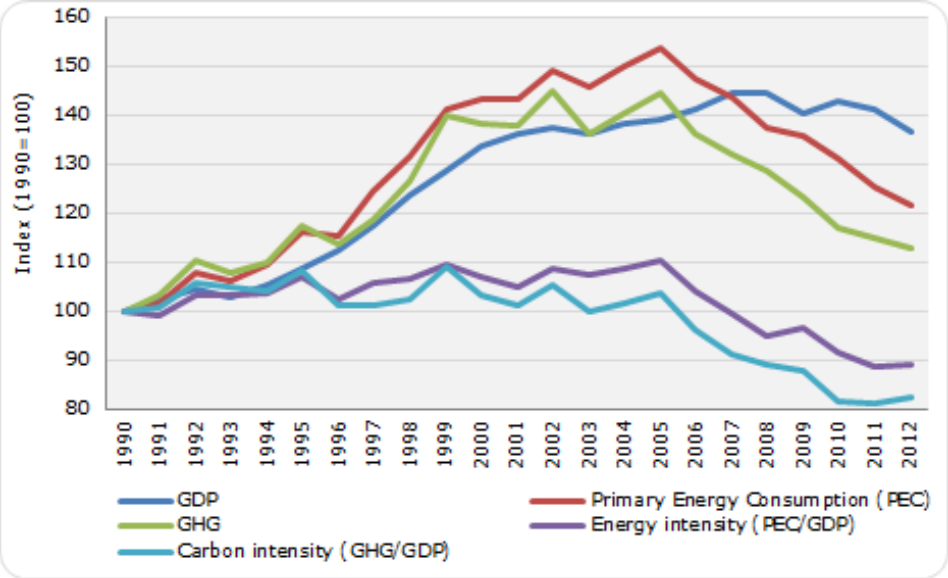
Key findings of the State of Environment report

Portugal has made significant advances in environmental protection and quality-of-life across several thematic areas. Among the indicators assessed, the water domain stands out with a very high level of performance in 2013. 98.2% of **drinking water** complies with health standards, while almost 100% of **bathing water** is safe.

Also standing out is Portugal's climate and (renewable) energy performance. In 2012, total Portuguese **GHG (greenhouse gas) emissions** (excluding those caused by land-use, land-use change and forestry (LULUCF)) were estimated at about 68,8 Mt CO_2 equivalent, representing an increase of 13,1% compared to 1990 levels, well below the EU burden-sharing agreement under which Portugal is bound to limit its annual emissions in the first commitment period (2008-2012) until 27% above 1990 levels. Furthermore, a review of all GHG emissions in Europe shows that in 2012 Portugal had one of the lowest per-capita levels among the EU-28, ranking sixth, with a value of 6,5 tonnes of CO_2 equivalent per inhabitant. The European average was 9 tonnes of CO_2 equivalent per inhabitant.

The **energy intensity of the economy** has been decreasing since 2005. In 2012, Portuguese energy intensity was 146,5 kg of oil equivalent per 1 000 EUR, while the EU-28 average was 143,2 kg of oil equivalent per 1 000 EUR. Regarding the **carbon intensity of the economy**, the turning point for a decreasing trend occurred earlier (from 2000), and is related to the increased share of renewables in primary energy consumption in the same period.

Figure 1. Relationship between GDP, energy consumption and greenhouse gas emissions



Source: Portuguese State of the Environment Report , 2013

In 2012, Portugal was the fourth country in the EU with the highest incorporation of renewable energy for electricity production. This year, the share of **renewable energy** sources in gross final energy consumption was 24,6%. The Renewable Energy Directive 2009/28/EC endorses a mandatory target of a 20% share of energy from renewable sources in overall community energy consumption by 2020. In Portugal, the target set is 31% of gross final energy consumption and 10% of energy in the transport sector by 2020. The share of renewable energy sources in gross electricity consumption for the fulfilment of EU obligations was 35,1% in 2012.

Regarding the **waste** sector, in 2013 the total production of municipal waste in mainland Portugal (4 362 million tons) decreased by about 4% compared to the previous year, from 454 kg per capita in 2012 to 438 kg per capita in 2013. This was below the EU-28 average for 2012 of 492 kg per capita per year. The percentage of municipal waste sent to landfill remains high (43%). Of the remaining municipal waste, 22% goes to energy recovery, 17% to mechanical and biological treatment, 9% to material recovery, 7% to mechanical treatment and 2% to organic recovery.

In mainland Portugal, the total area under **organic agriculture** increased from 0,2% to 6,1% between 1994 and 2012, reaching a share greater than the 2011 EU-27 average of 5,5%.

The **protected areas** of Portugal, classified under the National Network of Protected Areas and Natura 2000 represented 22% of mainland Portugal in 2013.

In 2013, **air quality** recorded a significant number of days rated "Good" and "Very Good", and a reduction in the number of days rated "Poor" and "Bad". However, the number of episodes of **tropospheric ozone pollution** and of **fine particles pollution** were higher than the long-term target established.

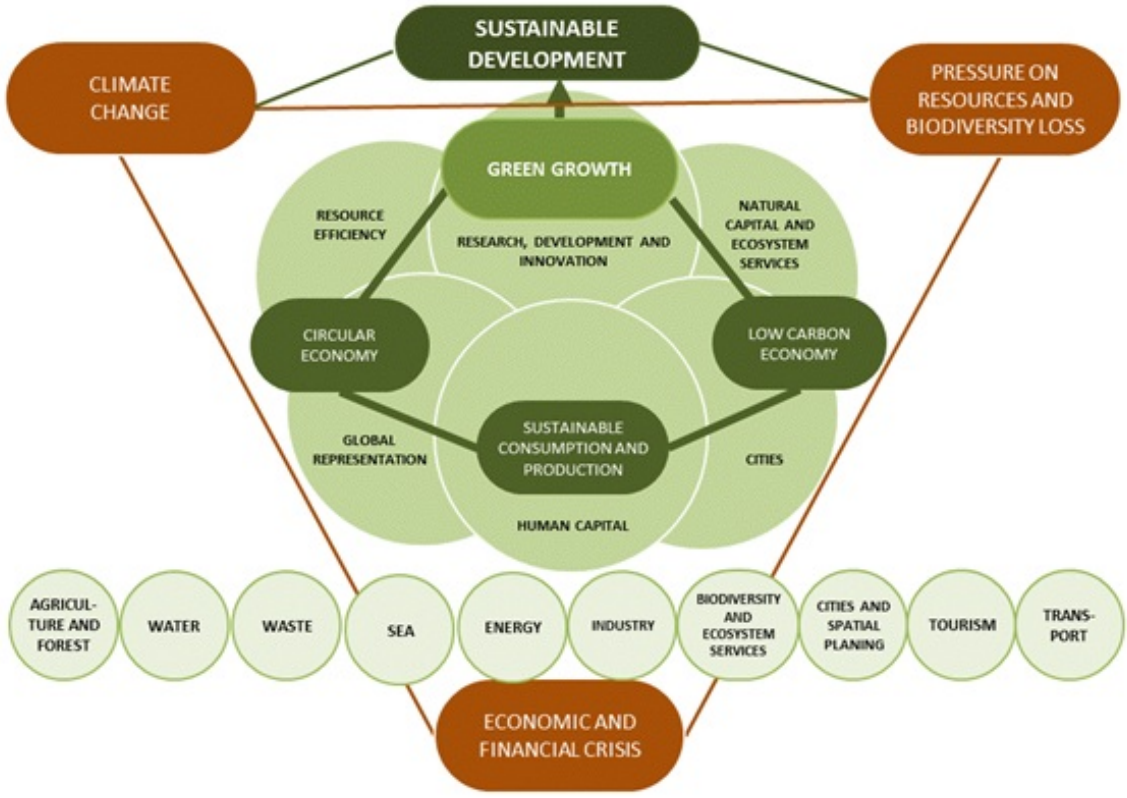
There are a few areas that need special attention to reverse negative trends. **Energy dependence** is among them, Portugal imported 71,5% of its energy needs in 2013, which is nonetheless the lowest value in 2 decades. The **transportation** sector, where energy consumption remains excessive also demands attention. Another area of concern is **forest fires** in mainland Portugal. In 2013, there were 152 756 hectares of burnt area, an increase of 38,6% compared to 2012.

Main policy responses to key environmental challenges and concerns

As Portugal is undergoing a structural transformation of its economy, the main public policy challenge is the establishment of an efficient, low carbon and environmentally-friendly resilient economy. The Portuguese government is currently developing a **Commitment for Green Growth**[3], which aims to comply with three major objectives by 2020:

- To position Portugal as a leader in green growth;
- To promote a low-carbon economy, highly efficient in resource use;
- To produce more wealth and jobs by investing in the sustainability of industries and territories.

Figure 2 - Green Growth at the centre of a new paradigm



Source: Commitment for Green Growth , 2014

For a country like Portugal, traditionally dependent on external **fossil energy resources**, it is essential to improve competitiveness through a more rational and efficient use of energy, while ensuring climate sustainability. So, in 2013, the new National Energy Efficiency Action Plan and the National Renewable Energies Action Plan[4] were approved

for the period 2013-2020. These two plans established an overall goal of reducing primary energy consumption by 25% by 2020, and a specific goal for the public administration to reduce primary energy consumption by 30% by the same date.

Portugal is among the most vulnerable European countries when it comes to the **impacts of climate change**. To address this issue, the government has been working towards the implementation of a post-2012 climate policy, focusing its priorities on the operational parts of both the National Strategy for Climate Change Adaptation[5] and the National Programme for Climate Change[6]. The government has also focused on monitoring the reconfiguration of the European Union Emissions Trading Scheme, on preparing the country for post-Kyoto challenges, and on reviewing the Portuguese Carbon Fund.

Concerning **waste management**, material and energy recovery has improved steadily over the years as a result of the policies implemented. A set of planning instruments is now under revision, in particular the Waste Management Tax and the licenses for waste and material flows. The Strategic Plan for Municipal Solid Waste for 2020 was recently approved[7].

With regard to **water resources**, a new planning cycle is being prepared, which includes the revision of the National Water Plan[8], further implementation of the National Program for the Efficient Use of Water[9], and the review of the River Basin Management Plans[10]. The new strategy for the urban water sector for the period 2014-2020, called "PENSAAR 2020 - A new strategy for the water-supply and wastewater treatment sectors (2014-2020)", will soon be published.

A central issue in Portuguese environmental policies is the vulnerability of the country's **coastal zones**. Policies regarding this subject have begun focusing on integrated coastal zone management, uniting maritime policies with climate-change adaptation policies. In 2014 the implementation process of the Coastal Valorisation and Protection Plan for Portugal (2012-15)[11] will continue. The National Sea Strategy 2013-2020[12] presents a new development model of ocean and coastal areas, which will allow Portugal to promote the growth and competitiveness of the maritime economy.

Country specific issues

> The relationship between the economy and the environment is, at the moment, particularly relevant. Portugal is strongly committed to simultaneously improving economic growth, job creation, and environmental conditions.

At the same time, the government has recently approved a green fiscal reform in order to allocate resources efficiently while ensuring tax neutrality. Portugal has also developed an ambitious legislative reform concerning several areas of environment and spatial planning.

Countries and regions

Romania

Main themes and sectors addressed in the national State of Environment report

Romania's State of the Environment Report 2012[1] is the country's latest report on the state of the environment. State of the Environment Reports are produced annually, and are based on the EEA's core set of indicators. The reports are compiled by the Romanian National Environmental Protection Agency and approved by the Ministry of Environment, Water and Forestry.

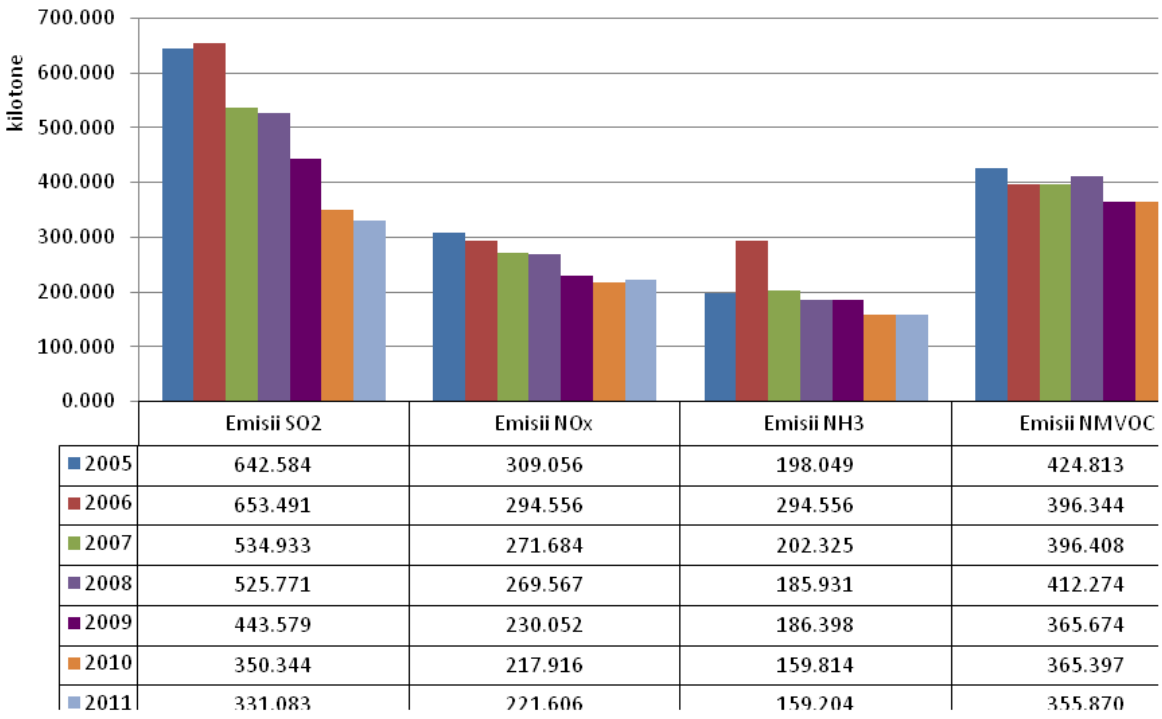
The 2012 report provides an assessment of the state of the environment, and of pressures acting on the environment, using data collected by local environmental protection agencies and other institutions responsible for environmental monitoring. The report addresses the following environmental themes:

- air quality,
- water,
- land use,
- protection of nature and biodiversity,
- waste management,
- climate change,
- health, and
- quality of life.

Key findings of the State of Environment report

Air quality: Between 2005 and 2011, emissions of greenhouse gases (carbon dioxide, carbon monoxide and ammonia) and their precursors have fallen. Emissions of other air pollutants also fell in the same period. Sulphur dioxide emissions fell by 48.8% between 2005 and 2011 (See Figure 1).

Figure 1: Annual emissions of acidifying and eutrophying greenhouse gases and ozone precursors



	Emisii SO2	Emisii NOx	Emisii NH3	Emisii NMVOC
2005	642.584	309.056	198.049	424.813
2006	653.491	294.556	294.556	396.344
2007	534.933	271.684	202.325	396.408
2008	525.771	269.567	185.931	412.274
2009	443.579	230.052	186.398	365.674
2010	350.344	217.916	159.814	365.397
2011	331.083	221.606	159.204	355.870

Source: Agentia Nationala pentru Protectia mediului - Raport National privind starea mediului, 2012

The 2012 report also highlighted the fact that **water resources** are unevenly distributed in the country. Due to the importance of both the Danube basin and the Black Sea and the need for protection of the environment in these areas, Romania declared its entire territory as a sensitive area. The result of this declaration is that any town with 10 000 or more people has to put in place advanced wastewater infrastructure capable of removing nutrients such as nitrogen and phosphorous.

Significant pressure on water resources in Romania comes from treated and untreated wastewater discharges into surface water[2] and from a number of diffuse sources of pollution. Hydromorphological pressures (from dams, riverbank protection, etc.) also put pressure on water resources. In spite of these pressures, Romania does not risk a reduction in the availability of water resources between now and 2050.

The good quality of Romania's bathing waters[3] was recognised in the EEA Bathing Water Report 2012.

Climate change is also affecting Romania. Between 1988 and 2010, average annual temperatures rose by 0.5° C, a value that is very close to the global average of 0.6° C.

The 2012 State of the Environment Report showed that, as in previous years, most of Romania's **land cover** was comprised of agricultural land (61.39%) followed by forests and other forest lands (28.35%).

Soil quality is coming under pressure from fertilisers, pesticides, and industrial activities (mining, steel, energy, etc.).

Compared to other Member States of the European Union, Romania is not even close to the position of being "saturated" with phytosanitary products (such as pesticides and fertilizers). The average consumption per arable hectare dropped between 1999 and 2012 from 1.18 kg of active substance/ha to 0.70 kg of active substance/ha. The general trend in land cover is towards a reduction in cover by agricultural land in favour of other types of land cover. Since 1990, Romania's agricultural land decreased by 133 500 ha, representing about 1% of total agricultural land.

Forests: Forests cover about 27.4% of the country's surface, or about 6.5 million hectares. In addition to providing

timber, forests also provide game and fish, forest fruit, edible mushrooms, wicker products, seeds, saplings, resin, honey, and medicinal and aromatic plants.

Biodiversity: Romania's biodiversity is one of the most remarkable in Europe. Romania has ratified the Convention for Biological Diversity. The Danube delta is of particular importance for biodiversity, hosting over 300 species of birds as well as 45 freshwater fish species in its numerous lakes and marshes. If not properly managed, this biodiversity could be affected by intensive fish farming, hunting, canal and dyke construction, and pollution[4].

Since 1993, the Danube delta has become a Biosphere Reservation. Romania has 978 areas of national interest and 531 Natura 2000 sites. Up to 25% of animal species are still threatened, and even non-threatened species continue to suffer from a lack of appropriate habitats outside of protected areas.

Marine and Coastal Environment - Black Sea: The Romanian coastal area along the Black Sea has a length of 244 km, representing 7.65% of the national border. In 2012, the main anthropogenic pressures identified along the Romanian coast came from:

- tourism and recreation;
- the construction of holiday homes in tourist areas;
- expansion and modernisation of existing tourist ports;
- harbours and navigation;
- fisheries;
- agriculture; and
- the petrochemical industry.

As a result of these pressures, Romania's coast now faces significant problems including habitat destruction, coastal erosion, water pollution, depletion of natural resources and large-scale exploitation of natural resources.

Waste Management: Romania's National Waste Management Strategy aims to assist in the transition from the current model of development based on production and consumption to a model based on waste prevention and use of industrial recovered materials. This will ensure the preservation of natural resources and help to reconcile economic and environmental goals. In spite of this strategy, Romania is still facing some problems such as municipal waste management. In 2011, about 93% of the municipal waste collected by sanitation companies was disposed of in landfills. Recycling and recovery rates of this type of waste are still very low.

Main policy responses to key environmental challenges and concerns

In the area of **air quality** Romania plans to continue implementing and monitoring the effectiveness of its air-quality management plans.

In **water management**, Romania aims to achieve sustainable management of water by closely following the requirements of EU water-related directives. The country's flood management activities involve a mixture of short-, medium- and long-term policies to protect life, assets and the environment.

Romania has an integrated water strategy for the period 2010–2035, which covers various policy areas affecting water resources, such as urban development, environmental protection, agricultural and forest development, transport infrastructure, tourism and construction.

Romania's **National Biodiversity Strategy** requires environmental impact assessments to be made before any development plan is approved in protected natural areas of community interest. It also establishes indicators to assess the health of species and habitats in protected areas.

In **waste management**, Romania has adopted the National Waste Management Strategy (NWMS) and the National Waste Management Plan (NWMP). The NWMS sets objectives for waste management. It was revised in line with new European guidelines and was subjected to an environmental assessment. The NWMP contains details about actions to be taken to achieve the goals of the strategy. The NWMP will be revised according to the new requirements of Romania's Law 211/2011 on waste that transposed Directive 2008/98/EC.

Country specific issues

Health and quality of life: According to the 2007-2013 National Development Plan issued by the government, the main goals of environmental policy in Romania are to ensure a clean environment for the health of Romanians, and to break the vicious circle of poverty and environmental degradation.

Biodiversity: Romania is implementing a long-term strategy for biodiversity protection by developing plans and projects meant to protect unique and extended types of natural habitats. Some of these habitats are possibly without equivalent in the European Union. For example, the Carpathian mountain range is a vital habitat for big carnivores. In 2012, the population of these carnivores was estimated at between 5 786 and 6 546 brown bears; between 2 501 and 2 932 wolves; between 1 200 and 1 435 Eurasian wildcats; and between 10 500 and 13 000 non-Eurasian wildcats. This population of carnivores represents a large number of the total population of these species in Europe.

Countries and regions

Serbia

Main themes and sectors addressed in the national State of Environment report

The Serbian Environmental Protection Agency (SEPA) has a responsibility to prepare a national State of the Environment (SOE)[1] report on a yearly basis. This is in accordance with Articles 76 and 77 of the Law on Environmental Protection[2]. This SOE report is one of the key documents in the field of environmental protection. Its role is to support decision makers as well as to provide environmental information to the scientific community and the general public. It also acts as an instrument for the direct application of Article 74 of the Constitution of Republic of Serbia[3] which describes the right of citizens to live in healthy environment while being continuously informed about its state in a timely and comprehensive manner.

Serbian SOE reports are based on the indicators approach by applying the Driving Forces-Pressures-State-Impacts-Responses (DPSIR) concept. Since 2006 reports have been produced on a yearly basis. The environmental topics presented in the report are grouped and organized in accordance with National list of Environmental Indicators[4]:

- Air quality and climate change;
- Water;
- Nature and biodiversity;
- Soil;
- Waste;
- Forestry, hunting and fisheries;
- Sustainable use of renewable resources;
- Economy and social potentials and activities;
- Subjects of environmental protection system;
- Implementation of national legislative in the field of environmental protection.

The overall quality of the SOE report has improved by increasing the amount and quality of collected data and information in support of updating existing and creating new environmental indicators.

Key findings of the State of Environment report

Air Quality[5] in urban agglomerations is characterized by polluting substances exceeding daily limit values. An increase in particulate matter (PM_{10}) and Nitrogen dioxide (NO_2) concentrations have been detected in urban areas. An "Appropriate Plan of Air Quality Management" has been prepared for municipality of Bor due to high levels of sulfur dioxide (SO_2). Pollen has been also observed and ragweed was again detected as a dominant allergen.

Air emissions indicators show a fluctuating trend for SO_2 and NO_x which occurred due to the decline in industrial production. An increase in NH_3 took place after 2005. The most significant contribution to the total quantity of emissions of these gases provides energy sector (NO_x-57% and SO_2-82%) and agriculture (92% forNH_3). Emissions of PM_{10} are constant for the whole period and the most important sources are the energy sector (55%) and agriculture (29%). NMVOC emissions are constant for the entire period.

Surface and ground water quality monitoring, performed by the SEPA, shows that in most cases concentrations of BOD, ammonium ion, nitrates and orthophosphates remain within range defined as excellent or good ecological status (I and II class of water quality). The worst quality has been detected in surface waters (rivers and channels) in the province of Vojvodina because concentration of polluting substances of almost half of the samples are not within ranges prescribed for particular water bodies.

Regarding **water emissions**, the law states that sewage systems should be managed by public enterprises. Data indicates average connection rates to the sewage systems for 60% of inhabitants. A survey carried out in 2013 noted that 23 communities reported that they have access to an Urban Waste Water Treatment (UWWT) plant. In 2012, 67 Pollutant Release and Transfer Register (PRTR) industrial facilities submitted data about wastewater discharging from 167 outlets. Eighty of them have some form of treatment - mechanical or biological. 54.76% of industrial facilities discharged their wastewater into the river and 19.04% into city sewer systems.

In the field of **waste management** indicators for municipal solid waste (MSW) generation shows that MSW increases, except in 2012. Total amount of generated MSW for 2012 was 2.62 million tonnes (0.36 t per capita). Average coverage of waste collection is around 70%. 21 MSW landfills sites are less than 100 m from watercourses and 5 of them are practically on the river banks. The total amount of industrial waste generated in Serbia in the 2012 was 8.2 million tonnes. The share of hazardous waste in this amount was 3%.

Biodiversity[6] **and forestry** issues have been also tackled in the SOE. One of the key progress indicators is the increase in the number of protected species. They increased to 1760 for species under strict protection and 868 under protection. More than 50% of strictly protected species are listed within international conventions and EU Directives. Forests cover around 32% of territory of Republic of Serbia therefore keeping forest exploitation within sustainable thresholds.

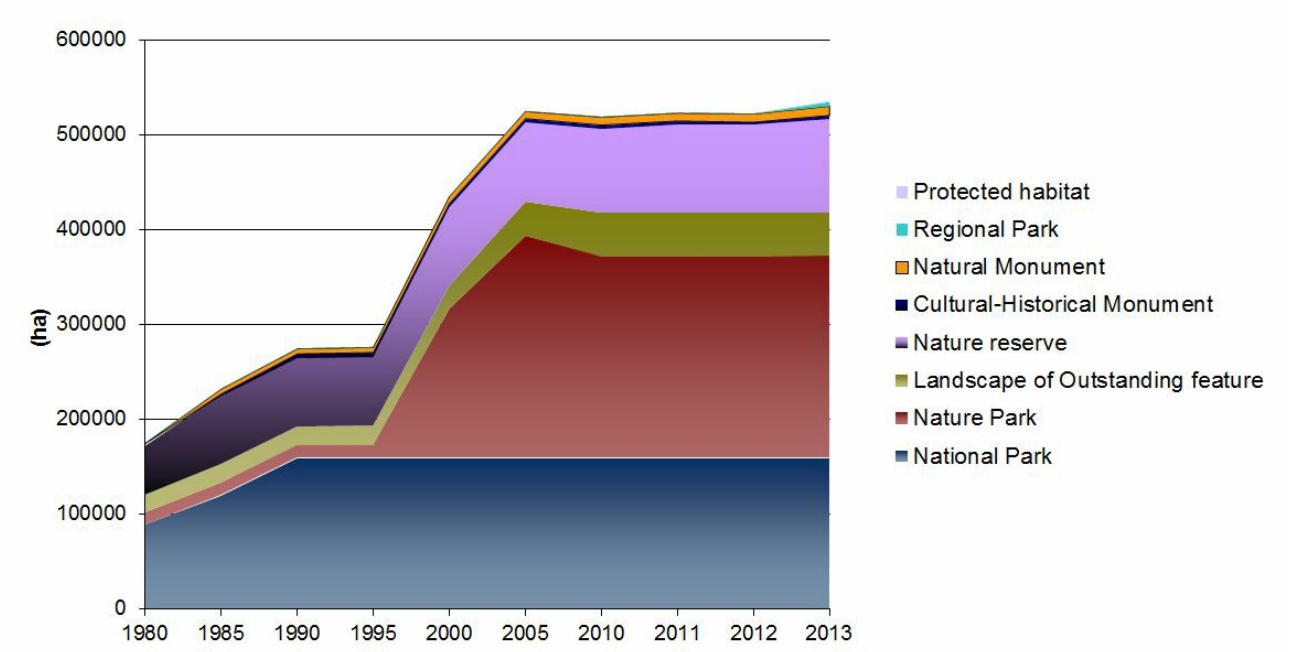
Soil quality monitoring has not been established at the state level. The main soil pollutants are Zinc (Zn), Copper (Cu), Nickel (Ni), Chromium (Ch) and Cobalt (Co). At the national level, there are about 384 localities comprising potentially contaminated (90%), contaminated (8%) and re-mediated sites (2%).

Results of the analysis of local soil pollution sources showed that the majority of sources come from public municipal waste dumps (43.5%) followed by locations used for exploitation and oil production (22.5%). Other important soil pollution sources are industrial waste dumps and industrial facilities. At the same time, examination of soil samples in proximity to 28 industrial facilities showed increased values of several elements.

Main policy responses to key environmental challenges and concerns

Protected areas cover just 5.91% of total area, which is insufficient based on national targets of 12%[7]. During the period 1980-2006 average annual increase of protected areas was about 13000 ha. In 2007 and 2008 only 1083 ha were protected. From 2008 to 2012 the area of protected areas actually decreased by around 20 000 ha due to the correction applied at these areas.

Figure 1. Cumulative surface of different protected areas



Source: Ministry of Agriculture and Environmental Protection

As a response to the need for establishing an integrated environmental monitoring during the period 2010-2014, efforts have been applied in increasing the scope of soil quality monitoring. This includes a systematic assessment of chemical pollution in urban areas and industrial zones. In 2010 a regulation[8] was adopted creating a base for systematic soil quality monitoring and inventories of contaminated sites.

Policy in the energy field has been focused on increased use of renewable energy sources, implementation of programs for energy efficiency, cleaner development mechanisms and increased reliability of energy supply. Serbia has set its internal goal to increase the share of renewable energy sources in gross final energy consumption to 27% by the year 2020. Implementation of the first energy efficient action plan for the period 2010-2012 has achieved 81% of planned energy savings for this period.

Resource efficiency considerations are included in a number of key policies: National Environmental Protection Programme[9], National Strategy for Sustainable Use of Natural Resources and Goods[10], Strategy of Energy Sector development till 2015[11], National CDM Strategy[12].

Significant progress has been achieved in the field of economic instruments for environmental protection by adopting a set of laws in 2009[13] which define new environmental taxes thus increasing revenues. Such laws have also been applied at a local and regional level.

Country specific issues

Sustainable use of water resources requires specialized programmes for control and mitigation of drinking water losses in distribution systems. Such programmes should contain projects for distribution network recovery and increasing management efficiency. Namely, average water losses in public water supply systems were about 33% in 2012. The common characteristics of these systems with significant losses are limited water resources and a deficit in water supply.

There has been a decrease of 10-15% of the game animals during the last five years. This is an important indicator as regards forest and grassland ecosystem stability. The numbers of game animals have not increased despite an increase of 75% in the forest area in the last 50 years.

Systematic control of agricultural soil fertility indicates that the amount of organic carbon in arable land has decreased. More than 50 of soil samples have a low level (1.1-2%) of organic carbon while 12.8% of samples have a very low level (<1%). The sustainability of agricultural ecosystems in Serbia mostly depends on correct system management.

In order to increase energy efficiency, institutional decentralization has been initiated. In addition to the Ministry in charge of energy, six Regional Energy Efficiency Centers and the Network of energy managers Serbia have been established. Efficient use of natural resources policy has been identified as a main driving force in the process of a transition towards green economy.

National legislation on air quality has defined and established a state network for monitoring of allergen pollen concentrations, a natural "pollutant" impacting on the health of the population health.

Countries and regions

Slovakia

The state of the environment in the Slovak Republic has improved significantly since 1993. However further efforts are required to achieve all objectives of environmental protection.

Main themes and sectors addressed in the national State of Environment report

The SOE Report[1][2][3] is published annually by the Ministry of the Environment of the Slovak Republic, in cooperation with the Slovak Environment Agency in accordance with section 33b of the Act 17/1992 Coll. on environment as amended. The framework structure of the SOE Report is defined in section 7 of Act 205/2004 Coll.

> ... on the collection, storage and dissemination of information on the environment as amended, pursuant to which the SOE Report must particularly include data on the state of the environment and on causes and consequences of the said state, as well as data on trends of its development and on measures to protect and improve the environment, including international cooperation.

The content of the SOE Report consists of following chapters:

- Components of the environment and their protection
- Urban and rural environment
- Environmental regionalisation
- State of the environment – causes and consequences
- Environmental risk factors
- Selected tools of environmental care and International cooperation.

Within this structure, the indicators[4] that represent a dynamic basis of the assessment process have been defined.

The annual SOE Report has to be published by 15 December of the following year.

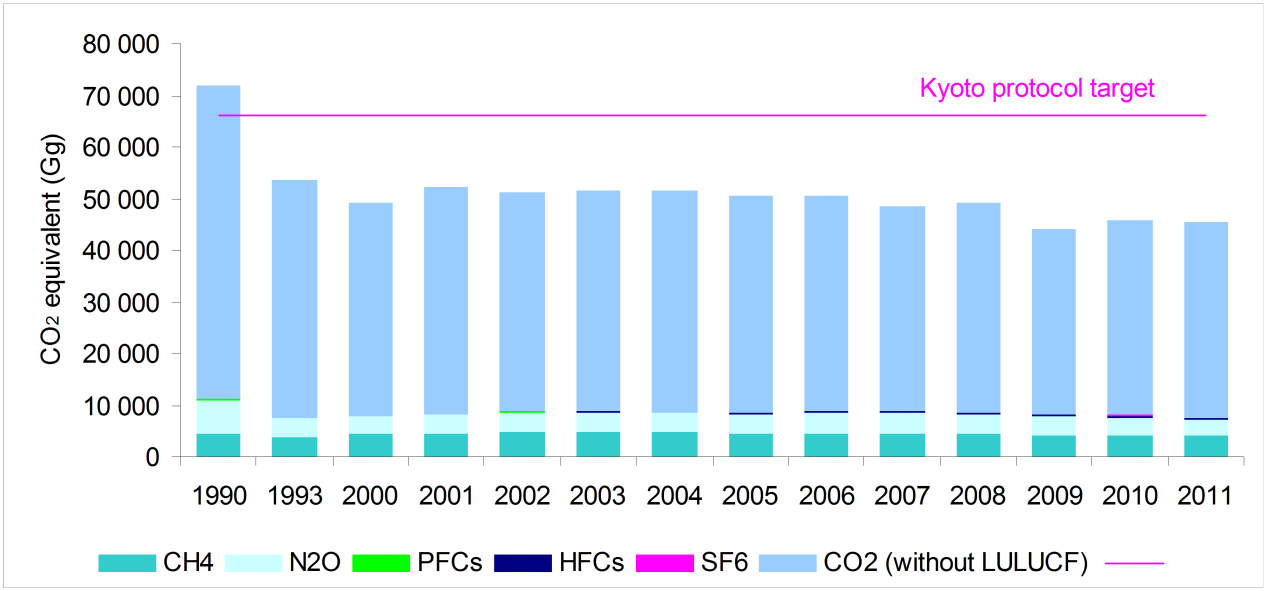
Key findings of the State of Environment report

The economy of the Slovak Republic shows a positive development of economic indicators in the long-term horizon. In most cases, the trends for environmental indicators can also be evaluated positively, which is reflected in improvements in the quality of the environment. In most environmental indicators, there is a decoupling of their development in relation to economic growth.

Emissions of air pollutants between 1993 and 2012 were reduced. However, the speed of reduction after 2000 slowed down significantly, or in some cases maintained at the same level. For some pollutants slight annual increases were recorded, especially for solid pollutants due to the increase in consumption of firewood in the households, and for persistent organic pollutants due to the increase in consumption of solvents in the chemical cleaning sector.

Greenhouse gas emissions decreased by 36.9% when the years 2011 and 1990 are compared. A slight increase in emissions was recorded after 2009 due to economic recovery.

Figure 1: Anthropogenic greenhouse gas emissions in the Slovak Republic



Source: Slovak Hydrometeorological Institute

Despite these improvements in emissions, in 2012 the limit values of selected air pollutants (NO_x, PM_{10}, $PM_{2,5}$) at several monitoring stations were exceeded. The reduction of national emissions of ozone precursors resulted in no reduction of ground-level ozone concentrations, which remain at a relatively high level as in previous years.

In 2012, **waste water production** fell by 47.2% compared to 1994. The number of inhabitants connected to public sewerage systems reached 62.4% in 2012.

Very good and good ecological status was recorded in 70.51% of **surface water bodies,** and average ecological status in 25.36%. Good chemical status was recorded in 90% of surface water bodies. Good chemical status was recorded in 82.7% of **ground water bodies**.

In 2012, the share of favourable **drinking water** analyses for compliance to limit values reached 99.67%. The number of inhabitants connected to drinking water from public water supplies reached 87.0% in 2012.

Excellent **bathing water quality** was recorded at 23 sites (72% of the total bathing water sites). Eight sites (25%) had good bathing water quality, and one natural swimming pool (3%) was classified as a site of sufficient quality of bathing water.

Approximately 39% of all agricultural land types were threatened by water **erosion** in 2012 and about 5.5% of the total area of agricultural land types were threatened by wind erosion.

According to the first report on the state of **species and habitats** of European importance (for the years 2004-2006): 19% of habitats and species of European importance are in a favourable condition, 34% are in an unfavourable condition, and 18% are in poor condition. The condition of 29% of habitats and species of European importance are unknown.

Concerning **nature conservation**, in the Slovak Republic there are 1 128 protected areas of the national network covering an area of 1 142 151 ha. This constitutes 23.3% of the country area. The NATURA 2000 network is made up of 473 sites of European importance constituting 11.9% of the country's area, and 41 protected bird areas constituting 26.16% of the country's area.

In 2012, 323 kg of **municipal waste** per capita was generated. There has been a high rate of waste landfilling in total waste disposal (almost 81% for waste other than municipal, and 74% for municipal waste).

Over the years 2006 to 2011, the share of energy produced from **renewable energy sources** grew by more than 49%. In 2011, the share of the energy produced from renewable energy sources reached 9.7%.

Main policy responses to key environmental challenges and concerns

In the report **Orientation, Principles, Priorities and Main Tasks of the Care of the Environment of the Slovak Republic for 2014 - 2020** (March 2013), the following seven priorities for the care of the environment were established:

- Protection and rational use of water and integrated environmental management of river basins;
- Adaptation to the adverse effects of climate change and flood protection;
- Air and the ozone layer protection, introduction of low-carbon and environment friendly technologies;
- Minimization, recovery and disposal of waste, efficient use of resources and development of green economy;
- Care of biodiversity, natural heritage and landscapes;
- Protection and rational use of the rock environment, elimination of environmental risks and environmental burdens;
- Support to environmental education, science and research, environmental monitoring and informatics, and voluntary environmental policy instruments.

In February 2010, the management plan of the national section of the Danube River Basin District - **Water Plan of the Slovak Republic**[5] - was adopted. This management plan aims to achieve the comprehensive protection of water quality and water availability throughout the country.

National targets for the share of energy from renewable sources and measures for their adoption were established by the **National Action Plan for Energy from Renewable Sources** [6], approved in October 2010.

The **Environment and Health Action Plan of the Slovak Republic IV**[7] was approved in January 2012. Its basic objective is to minimise environmental risks that can harm or endanger human health - especially children - through the implementation of the proposed activities.

The **Waste Management Programme of the Slovak Republic for 2011 to 2015**[8] (February 2012) sets out the waste management strategy. It specifies the objectives and measures to achieve them, as well as funding to ensure compliance with the hierarchy in waste management reflected in the Waste Directive.

In February 2013, the **Strategy for PM_{10} Particles Reduction**[9] was adopted. The objective of the Strategy is to achieve and maintain good air quality throughout the Slovak Republic, i.e. scientifically sound air quality levels that do not endanger human health or the environment.

The main objective of the measures taken in **Waste Prevention Programme of the Slovak Republic for 2014-2018**[10] (December 2013) is to decouple economic growth from environmental impacts connected with waste generation.

In January 2014, the updated **National Biodiversity Strategy by 2020**[11] was adopted. Its objective is to create a policy framework to halt the trend of biodiversity loss.

> Priorities for the sustainable growth of society and for employment include the creation of a competitive economy that uses resources in an efficient and sustainable manner, minimises impacts on the environment, and is based on knowledge and innovation.

Country specific issues

The issue of environmental burdens in the Slovak Republic is being solved in a comprehensive way beyond the requirements set by European Union.

In the years 2006 to 2008, a systematic **identification of environmental burdens** was carried out. Environmental burdens were classified into high, medium and low risk of harm. The Information System of Environmental Burdens[12] accessible to the public was built.

In 2009 an update of the Geological Act[13] was adopted, which defined an environmental burden - a site, where hazardous substance caused by human activities poses a significant risk to human health or to the rock environment, groundwater and soil, except environmental damage - and a potential environmental burden - a site where a presence of contaminated soil is reasonably expected.

In 2010, the **State Remediation Programme of Environmental Burdens** was approved by the Government, and the regional studies of the impacts of environmental burdens on the environment were developed. The Act on "environmental burdens" no. 409/2011[14] was adopted, which laid down the conditions for systematic addressing of the issue.

Also, in 2010 methodological documents such as Guideline for the Development of Risk Analyses of Contaminated Sites and the Manual for the Procedure of Financial Forecast for Exploration and Remediation were adopted.

From the **Operational Programme Environment 2007-2013**, projects focused on the monitoring and research of environmental burdens and risk analyses development, remediation of high risk contaminated sites, completion of the Information System of Environmental Burdens, environmental education and promotion as a support for environmental burdens addressing have been funded.

At the end of 2012, the Information System of Environmental Burdens included 905 potential environmental burdens, 260 environmental burdens and 726 remediated sites.

Countries and regions

Slovenia

Main themes and sectors addressed in the national State of Environment report

Slovenia's Environmental Indicator Report 2014[1] is the latest national report on the country's environmental issues and is also the basis for the State of Environment report[3], which is due to be published in 2015 according to the Environmental Protection Act[4].

The most relevant indicators in the report are summarised in the web-based system Environmental indicators in Slovenia[2], which is continuously updated.

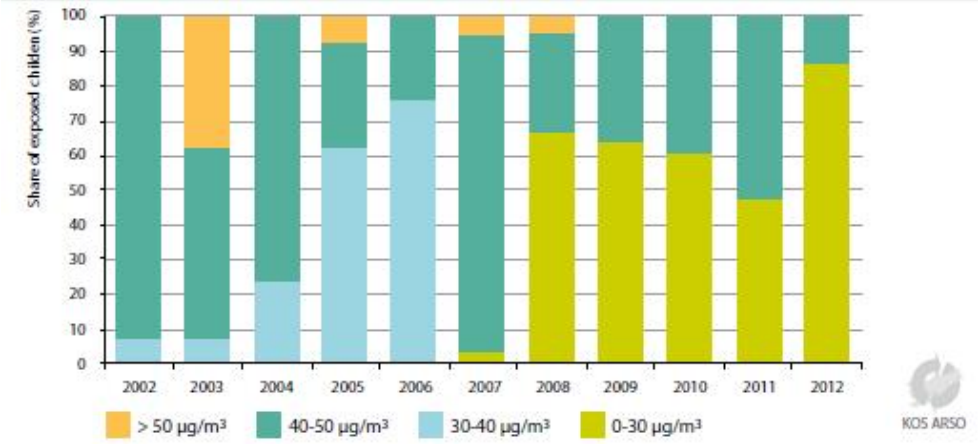
> The report is based on the DPSIR framework, taking into consideration the economic, social and environmental perspective. Every chapter has a summary in which the basic facts are presented along with an indication on how the environmental issues are interlinked. Every indicator has a short key message, trend-assessment sign, graph, description of the topic, and link to the relevant indicators in the system.

The main themes are Air quality and Climate change, Water, Land and Nature, Natural resources and Waste, supplemented by Health, Transport, Energy, Agriculture and some other indicators related to environment.

Key findings of the State of Environment report

Air quality

Figure 1: Exposure of 0-15 year old children to PM_{10} concentrations in the ambient air



Note: The PM_{10} WHO air quality guideline for the annual mean is 20 µg/m ^{3}, while the EU limit value is set to 40 µg/m ^{3}.

Source: Database on hospital treatments, National Institute of Public Health, 2013; Automatic Air Quality Measurement Database (DMKZ), Slovenian Environment Agency, 2013.

Road traffic and domestic heating using wood in outdated appliances followed by power generation, industry, and agriculture are the main sources of air pollution. **Particulate matter and ozone are the major environmental and health problem.** Recent health studies have confirmed links between air pollution from particulate matter PM_{10} and the development of asthma in children. Children in Slovenia (0-15 years of age) are on average exposed to PM_{10} annual concentrations of 30–40 µg/m^3, which is above the level recommended by the WHO (Fig. 1). Measures to improve the air quality are aimed at enhancing efficiency in the transport and energy (including buildings) sectors.

Freight and passenger transport volumes are increasing. **Emissions from the road transit traffic are causing most concern**. As Slovenia is located at the crossroad of the fifth and tenth corridor, between SE and W Europe a lot of goods are passing through Slovenia. Increase was significant after Romania and Croatia became an EU member.

Climate change

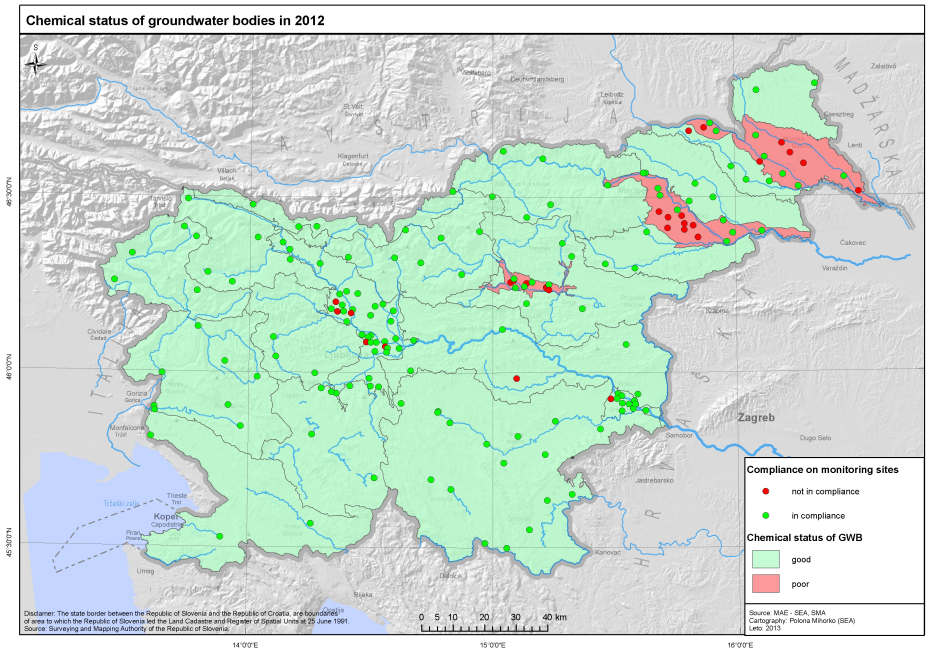
The **average annual temperature increase** in Slovenia is greater than the global average. A cause for even greater concern is the **change in seasonal precipitation patterns**. The number of hot days is increasing, and the precipitation regime is changing. This may cause the Triglav glacier to completely disappear in the next few years.

In Slovenia, the use of fossil fuels in the energy sector, households, industry and transport accounts for more than three quarters of all greenhouse gas emissions. In addition to climate change mitigation, adaptation to changing climate is also necessary.

Water

Slovenia is rich in water, but water resources are vulnerable and distributed unevenly. Slovenia uses only a small portion of available water run-off for human use (about 3%). Approximately 15 billion m^3 of water flows out of Slovenia through rivers every year, but long-term trends show that this volume is falling. Because of the country's headwater position and the torrential character of the majority of water courses, the flow rate varies greatly during the year, with a **lack of water in the vegetative period** and large quantities of water - or even **floods** - during the other periods of the year. The **annual groundwater recharge** also varies considerably.

Figure 2: Chemical status of groundwater bodies in 2012



Groundwater is the main source of drinking water in Slovenia. Most **groundwater bodies had a good chemical status** in 2012 (Fig. 2). Water protection areas cover 17% of Slovenia's land area, and nearly one third of these water protection areas is agricultural land. The intensity of agricultural production in Slovenia has been moderately increasing in the last two decades. However, the excess of nitrogen from fertilisers and the use of phytopharmaceuticals have been declining in last decade. The percentage of people whose waste water is treated in municipal waste-water treatment plants has increased considerably, but it is still only 55%. The **majority of surface water bodies have good chemical status** and slightly more than **half also have good ecological status**.

Land and nature

Diverse land cover, and land use with interweaving forest, agricultural and built-up areas are characteristic of Slovenia. **Forests cover more than one half of the surface area**, and built-up areas slightly less than 3%, according to CORINE Land Cover data. However, the share of built-up areas has been constantly increasing.

Slovenia's biotic wealth is reflected in the habitat types and **species of European importance. Natura 2000 sites amount to 7 683 km^2 or 37.9%** of Slovenia's land area. Nearly half of Slovenia's habitat types and 28% of its species have favorable conservation status.

The **effective management of nationally protected areas** (such as national, regional and landscape parks, covering 13% of the territory) and valuable natural features, including 11,138 underground caves, can facilitate the conservation of species and habitats.

Forests have a special place in the biotic wealth of Slovenia. The share of forests with conserved **natural tree composition exceeds 50% of all the country's forests**, indicating resilience and sustainable management.

Natural resources and waste

The exploitation of natural resources generated or extracted in Slovenia has declined since 2007. 22 million tonnes were exploited in 2012, of which the vast majority were mineral resources used in the construction industry. Imported materials and goods also declined after 2008. Domestic material consumption per capita was 12.4 tonnes in 2012. Material productivity has been rising since 2007.

The largest quantity of waste is generated from production and service activities (3.7 million tonnes in 2012). Since 2002, 60% of such waste has been recovered, and recovery rates continue to grow. In 2012, 672 000 tonnes of municipal waste were generated (327 kg per capita). Thanks to separate waste collection and other legal measures, **the quantity of landfilled municipal waste has declined** (from 74% in 2008 to 47% in 2012).

Extended producer responsibility started to be introduced in most sectors in 2004 (packaging waste, end of life vehicles, waste medicinal products). The recycling rates of the collected waste in general meet current targets, but the collection rates themselves need to be improved.

Main policy responses to key environmental challenges and concerns

Air quality plans for specific areas[5] - seven air quality plans for the country's municipalities have been prepared in partnership with the municipalities, which gives a good prospect for successful implementation.

Climate Change: an action plan for decreasing GHG emissions is being prepared. **A risk assessment of natural and other disasters** that pose the greatest risk at the national level will be prepared. **Completing the construction of a complex-weather radar** (in addition to the existing one) is crucial for short-term forecasting of extreme weather events.

Water: An operational programme for drinking water supply will be prepared. It will also address the problem of water loss from the public water supply, which currently runs at 30%. **Slovenia is upgrading the system for monitoring and analysing the state of its water environment**[6]. The project will increase the capacity for integrated assessment and monitoring of the whole water cycle.

Nature and biodiversity: the land covered by **Natura 2000** has expanded. Slovenia remains one of the EU countries with the largest share of land covered by Natura 2000. **A new biodiversity strategy for Slovenia** is being prepared.

Natural resources and waste: Slovenia is preparing a **national development programme** to establish an adequate waste management infrastructure and is also conducting an expert study to prepare guidelines for a resource-efficiency action plan.

Country specific issues

Instruments for financial support to companies, research institutions and individuals

Three development policy instruments with an emphasis on environmental objectives (**the Centres of Excellence**[7], **the competence centres**[7] and **the Economy Development Centres)** were established with the aim of connecting different companies with research institutions. The challenges posed by the economic crisis and environmental concerns were jointly addressed and the centres have already delivered concrete results for the economy.

Another instrument providing support to individuals is the **ECO Fund**[8], which creates financial incentives for various energy-efficiency measures and renewable energy schemes.

Natura 2000 MP: the **Natura 2000 Management Programme**[9] for Slovenia is a strategic approach to better Natura 2000 funding. In the programme, existing policies (especially CAP and regional development) and management systems (water management, forestry, protected areas) are actively used for the achievement of Natura 2000-network objectives. Slovenia also used the LIFE+ project to share experience concerning the management of Natura 2000 with other countries[10].

Countries and regions

Spain

Main themes and sectors addressed in the national State of Environment report

Starting in 2004, the indicator based report **"Environmental Profile of Spain"**[1] has been published every year. It provides an annual snapshot of the environmental situation in the country, analyses major pressures on the environment and monitors effectiveness of policies. Since 2012, the report is available through an 'app'[2] developed for tablets and smart phones. It describes 82 indicators organized in 17 environmental and sector areas: Air Quality and atmospheric emissions, Water, Land, Nature, Coasts and marine environment, Green Economy, Environmental Research, Development and Innovation, Waste, Agriculture, Energy, Industry, Fishing, Tourism, Transport, Households, Urban environment, Natural and technological disasters. There is also a chapter devoted to autonomous communities.

Key findings of the State of Environment report

Social and economic aspects

In 2012 Spain was the fifth most populated country in the EU-27 and had the fourth highest population growth during the 2000 to 2012 period (+15.3 %). From 2002 to 2009 Spanish GDP, measured in terms of purchasing power parity, was above the EU-27 average.

Air quality and emissions to the atmosphere

In 2012, Spain was responsible for 7.5% of the total emissions of the EU-28, emitting 7.28 tonnes of CO2-eq/inhabitant, a figure lower than the average values recorded in the European Union: 9.0 tonnes of CO2-eq/inhabitant. In relation with the GDP, Spain was also one of the countries with lower emissions and in order to produce a GDP unit, 0.33 kg of CO2-eq were released in 2012, whereas in the EU-28, such figure amounted to 0.35 kg of CO2-eq. Troposphere ozone precursor emissions during the 1990-2011 period decreased by 25.3 %. PM 10 emissions have fallen by 23.8 % since 2000, while PM 2.5 fell by 22.5 %.

Water

Consumption per capita from public water supply decreased by 175 litres in 2004 to 142 litres in 2011. By 2009, 28.64% of the 5 125 total surface water bodies in Spain were in 'good' status. By 2012 more than half of the sampling points for fresh water bathing zones had 'excellent quality'. Zones classified as 'poor quality' decreased whilst 'good quality' zones increased.

Land

Corine Land Cover for 2006 established that only 2 % of the total surface area in Spain is covered by artificial surface, one of the lowest in the EU and well below 4.6% of EU average. Soil erosion is a challenge in Spain. 12 % of the country (6 million hectares) suffered from erosion process (soil losses> 50 tons of soil/ha/year). Desertification can be considered serious (grades of 'very high' and 'high') in 17.85 % of the Spanish surface area.

Nature

By 2012, the Natura 2000 network represented 27.19% of the total Spanish area. The total forest area covered more than 27.5 million hectares (55% of the country's surface). The total woodland area is over 18 million hectares, representing 0.39 hectares/inhabitant.

Table 1: Protected area by protection category (2013)

Protected area (PA)	PA and NATURA 2000 NETWORK	Protected Areas	NATURA 2000 NETWORK
Terrestrial (ha)	14 120 005.99	6 286 147.49	13 778 251.98
Marine (ha)	1 070 564.34	488 312.53	1 028 089.68
Total (ha)	15 190 570.32	6 774 460.02	14 806 341.66
Terrestrial area protected (%)	**27.89**	**12.42**	**27.22**

Source: MAGRAMA[3]

Green economy

The energy intensity of the Spanish economy (135.5 kgoe/EUR 1 000 by 2011) is below the EU average (144.4 kgoe/EUR 1 000). As part of the strategy to reduce of GHG emissions, 37 climate projects were selected which will allow for a reduction up to 800 000 tonnes of CO_2-equivalent.

Waste

In 2011 total municipal waste production and waste production per inhabitant decreased to 531 kg/inhabitant. The rates for packaging waste recycling and recovery increased. Spain has a paper and cardboard recycling rate close to 80%.

Agriculture and fishing

In 2011 Spain was the European country with the largest land area dedicated to organic farming at 1 845 039 hectares. In 2012, irrigated land surface was 3 522 616 hectares, which was approximately 16% of the EU's total cultivated surface area. In 2011 the capacity of the Spanish fishing fleet continued to decrease. Total production in aquaculture in 2011 experienced a year-on-year increase of 3.3%, reaching 291 235 tonnes.

Transport

In 2011, 47.1% of all vehicles used gasoline and 52.9% diesel. There has been an increase in number of hybrid vehicles with approximately 20 700 registered vehicles.

Main policy responses to key environmental challenges and concerns

Air

The **National Plan for Air Quality and Atmosphere Protection 2013- 2016**[4] (adopted in 2013) sets the framework to improve air quality through specific actions undertaken in coordination with other sectoral plans aiming at promoting awareness and improving the information available on emissions from pollutants. Furthermore, in order to encourage take-up of vehicles with higher energy efficiency levels, incentives were set up for lower fuel consumption and CO_2 emissions and other pollutants from cars and vans. Since 2012 several Programs and Projects for the non-ETS sectors within the second period of the Kyoto Protocol (2013-2020) has been developed, such as the **Climate Projects** for promoting economic development and employment creation within the framework of the fight against the climate change, and the estimation of the **"Carbon Footprint"**. Different Plans focusing on specific sectors have been set up such as **"PIMA SOL"** which promotes the reduction of GHG emissions in hotel and other tourism facilities through energy efficiency improvements, etc.

Biodiversity

Spain is the first country of EU-28 in terms of contribution to the Natura 2000 network with nearly 17% of the European net. The Network of National Parks is an integrated system for the protection and management of natural areas of an outstanding value for the Spanish Natural Heritage. Therefore, the **conservation of biodiversity** is a major concern. Two examples of recent actions aiming at protecting the nature are:

- The regulation of **invasive alien species**, with the approval in 2013 of Royal Decree 630/2013, of August 2, whereby the Spanish list of invasive alien species is regulated.
- The integration of the environment in the **tourism economic activity**, through the approval of a sectoral plan of nature tourism and biodiversity 2014-2020.

Water

The transposition of the Water Framework Directive (WFD) to the Spanish legislation in December 2003 has led to a redirecting of Spanish water policy and hydrological planning including the following priorities:

- Changing the governance model: the transition towards a sustainable water model from an economic, social and environmental perspective.
- Strengthening water security and making significant progress in the sustainable management of water resources (Green growth).
- Developing sanitation and water treatment within the urban cycle.

Coast

Spain has made important progresses in the development of the Marine Protected Areas Network, going in 2014 from 1% to 8% of marine surface protected (Spain has more than 1 million km^2 of jurisdictional seas). A "State Plan for the Protection of the seaside against the marine pollution" has also been adopted, and marine strategies are being designed in order to achieve good environmental status of all Spanish marine waters by 2020.

Waste

The decrease for waste per inhabitant is a consequence of the **National Integrated Plan of Waste** (PNIR 2008-2015)[5], as well as of the implementation of prevention measures at autonomous communities and local level, and greater engagement from citizens. In 2013 Spain developed a State Waste Prevention Programme for the period 2014 to 2020 with the objective of reducing waste by 10 % by 2020.

Country specific issues

Regarding **environment and health two initiatives could be outlined:**

- The **Spanish Monitoring Plan** assesses the effectiveness of the measures taken to reduce POPs. Focused is on air at strategic points at 13 remote and 9 urban stations, using the EMEP network in collaboration with the Spanish Agency of Meteorology (AEMET).
- **Human biological bio monitoring** (HBM) has become the gold standard in pollutant exposure estimations in humans. It relies on measures of selected pollutants in air, water, food and soil, and promotes the design of a system to estimate the levels of selected pollutants in a representative sample of Spanish adults.

Regarding **natural heritage conservation:**

- The **Spanish Inventory of Traditional Knowledge on biodiversity in the framework of the Spanish Inventory on Natural Heritage and biodiversity** provides the basis to preserve and promote traditional knowledge relevant to the conservation of biodiversity. At least 1 927 species (25 % of all vascular plants) are associated with traditional use.
- Regarding biodiversity, **the Millennium Ecosystem Assessment in Spain** is the first analysis performed for the status and trends of terrestrial and aquatic ecosystems and their contribution to human welfare.
- In coast and marine environment, **the LIFE+ INDEMARES Project** aimed to quantify the Nature 2000 network in the Spanish marine environment over the past five years. It has protected more than seven million hectares of marine area.

In relation to the **water environment**:

- Spain has introduced the environmental flows (e-flows) in the first planning cycle as a prior restriction imposed in general systems of exploitation that guarantees the maintenance of ecosystems. Moreover, e-flows are considered a mandatory content of the river basin water management plans (art. 42). Spain is leading a European working group to share these experience and knowledge.
- **The National Strategy for River Restoration** emerged in 2006 with the ultimate goal to improve the ecological status of all Spanish water courses.

On Climate Change:

- A number of initiatives have arisen from the 2006 **Spanish Climate Change Adaptation Plan**, including a Health and Climate Change Observatory, a report on the impacts on health by climate change, tools such as C3E (climate change on the Spanish coast) and sectorial workshops for wildlife, agriculture, education or forestry stakeholders.

- In the field of energy, **the project for the connection of the mainland electricity system with the Balearic Islands** ensures a power supply via renewable energies. By 2013 electric power exchanges had provided an export balance of 1 266 GWh to the Balearic Islands, covering 22.3 % of demand. An evaluation in the first 120 days estimated annual emissions savings of 234 000 tons of CO2.

Countries and regions

Sweden

Main themes and sectors addressed in the national State of Environment report

Sweden has environmental objectives of three different kinds, a generational goal, milestone targets and quality objectives. The generational goal focuses environmental efforts on the recovery of ecosystems, conserving biodiversity and the natural and cultural environment, good human health, efficient materials cycles free from dangerous substances, sustainable use of natural resources, efficient energy use and patterns of consumption.

The 16 environmental quality objectives (box 1) should be achieved by 2020[1].

Box 1. Sweden's environmental quality objectives

The Swedish parliament has adopted 16 objectives for environmental quality in Sweden

1. Reduced climate impact
2. Clean air
3. Natural acidification only
4. A non-toxic environment
5. A protective ozone layer
6. A safe radiation environment
7. Zero eutrophication
8. Flourishing lakes and streams
9. Good-quality groundwater
10. A balanced marine environment, flourishing coastal areas and archipelagos
11. Thriving wetlands
12. Sustainable forests
13. A varied agricultural landscape
14. A magnificent mountain landscape
15. A good built environment
16. A rich diversity of plant and animal life

Every four years, an in-depth evaluation is undertaken. The latest, in 2012, was conducted in collaboration with all relevant government agencies, together with stakeholder and environmental organisations.[2] In addition, an annual follow-up of the objectives[3] takes place which provides a basis for the Government's progress report to the Parliament, and also formes part of the background material for the Budget Bill.

Various tools are used to assess progress, including indicators that reflect trends in relation to the different objectives. The Environmental Objectives Portal is an on-line gateway to information about Sweden's environmental objectives and progress towards achieving them.[4]

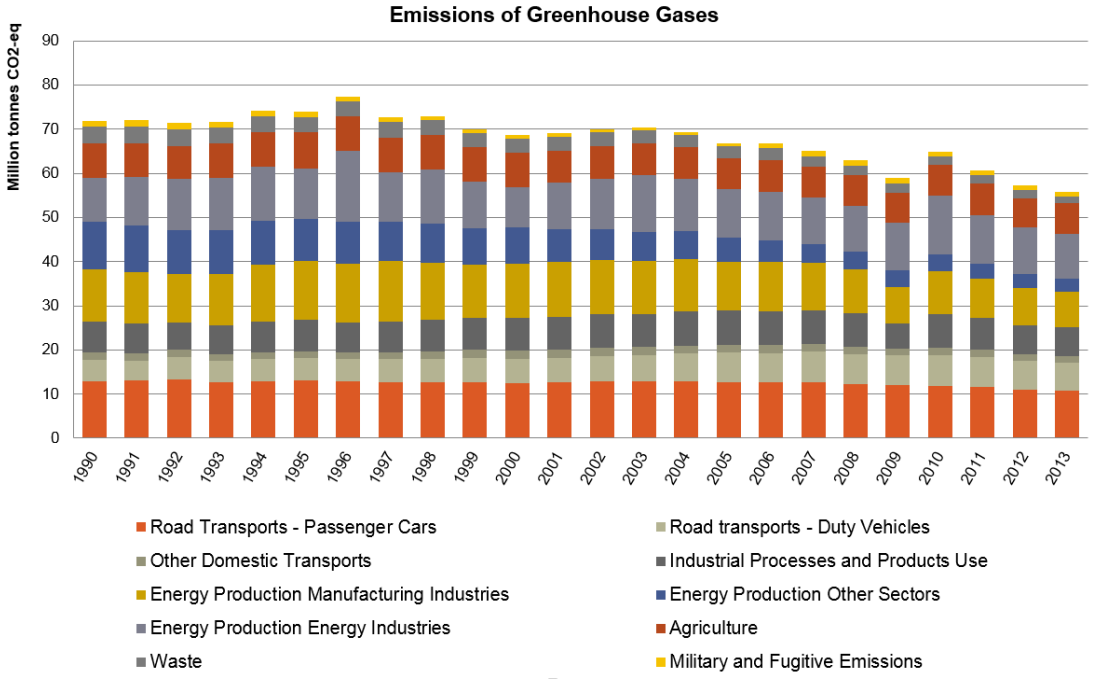
Key findings of the State of Environment report

Current state of the environment

For most of the environmental quality objectives the situation is complex, with positive trends for some components of them, but more negative trends for others. Certain emissions, e.g. of phosphorus, nitrogen, sulphur dioxide and lead, have been reduced to some extent, but in some areas the beneficial effects, for instance on air quality, acidification and eutrophication, are taking time to emerge. This is due to nature's slow capacity for recovery and the complex relationships between emissions and levels in the environment. Levels of some toxic pollutants are declining, but persistent ones are a major problem.

Global emissions of greenhouse gases (GHG) are rising, and future climate change will have negative implications for many of the environmental quality objectives. However, Swedish emissions continue to fall and preliminary data for 2013[5] show the lowest level since the 1990 base year (figure 1). While emissions of GHG have decreased in Sweden, emissions in other countries as a result of Swedish consumption have increased.

Figure 1: Greenhouse gas emissions, 1990-2013



Note: Total Swedish Greenhouse gas emissions, excl LULUCF and International Bunkers. Units – million tonnes CO 2-equivalent. Preliminary data for 2013.
Data source: Swedish Environmental Protection Agency, 2014

Certain aspects of the environmental status of seas, lakes, watercourses and groundwaters, and of several terrestrial ecosystems, remain problematic, not least as regards eutrophication and biodiversity.

While the overall situation regarding the environmental quality objectives is negative, trends in the state of the environment vary from one objective to another. The goals with the most negative trends are 'Reduced Climate Impact', 'Thriving Wetlands', 'A Varied Agricultural Landscape' and 'A Rich Diversity of Plant and Animal Life'. The objectives 'Clean Air', 'Natural Acidification Only', 'Good-Quality Groundwater' and 'A Magnificent Mountain Landscape', on the other hand, show positive trends, albeit weak.

Conditions for meeting the objectives

An evaluation and assessment of external factors shaping progress, such as the world economy, political developments and EU decisions, as well as of the effects of policy instruments and measures, conflicts between policy areas and the influence of different agencies and stakeholders, requires a far-reaching analysis of complex relationships. At a more general level the most important background factors affecting progress towards the objectives include a need for international policy instruments, common EU policies, a need for initiatives in other policy areas besides environmental policy, implementation of legislation, collaboration, and public agencies' resources for environmental action.

Another way of looking at the conditions for meeting the objectives is to study the underlying reasons why they are not being achieved. There are many such reasons; one is increased pressure on resources, having a negative impact via forestry, agriculture and energy production. High living standards and high levels of consumption affect both the situation in Sweden and the state of the environment abroad.

Main policy responses to key environmental challenges and concerns

Parliamentary support and broad consensus are central to environmental work. **The Cross-Party Committee on Environmental Objectives** advises the Government on how the objectives can be achieved and, in cooperation with agencies in the environmental objectives system, delivers proposals on strategies and milestone targets, policy instruments and measures in priority areas.

In 2015 the Government established an Environmental Objectives Council to strengthen the implementation of environmental policies. The Council is a platform for Heads of agencies that are strategically important for achieving environmental objectives.

Recent strategies from the government and strategies that are underway

In 2014 the Government adopted a strategy for biodiversity and ecosystem services[6]. The strategy has significance not only for many of the objectives and the generational goal but also for the international Aichi targets adopted under the Convention on Biological Diversity, as well as the objectives of the EU biodiversity strategy.

In 2013 the Government presented the strategy for chemicals policy[7]. It is a strategy for how to achieve the environmental quality objective 'Non-Toxic Environment' as well as relevant parts of the generational goal.

In 2014 the Government instructed the National Housing Board to develop a proposal for a strategy with milestones and measures to achieve the objective 'A Good Built Environment' and the relevant parts of the generational goal. The task was reported in December 2014[17].

In 2013 the Government instructed the Environmental Protection Agency to develop a proposal for a strategy with milestone targets, measures and instruments that will contribute to reaching the objective 'A Magnificent Mountain Landscape'. The task was reported in June 2014[8].

In 2012 the Committee on Environmental Objectives was tasked by the Government of drawing up a strategy for long-term sustainable land use and a strategy for a cohesive and sustainable water policy. A final report was presented in June 2014[9].

The **Milestone targets** are intended to identify a desired social change and specify steps towards achieving the generational goal and one or more of the environmental quality objectives. They are to function as guidance to county administrative boards, government agencies, municipalities and the business sector on important priorities for continuing environmental action. Milestone targets can also be added to the environmental objectives system on the basis of goals adopted within the EU or by incorporating international agreements. As of March 2014 there are 24

adopted milestone targets, divided into five areas: climate, air pollution, dangerous substances, waste and biodiversity[10].

Country specific issues

The Government gives priority to efforts to reduce climate emissions, a toxic-free everyday environment, lakes and oceans, ecosystems and biodiversity. Below are a few examples:

In 2015 the Government tasked the Committee on Environmental Objectives to propose a climate policy framework for Sweden[11]. This includes proposing a new long-term climate goal for Sweden's reduction of emissions of GHG by 2050 and a strategy with revised or new cost-effective and long-acting instruments and measures for different sectors of society. The task will be reported in February 2016.

The Government has instructed the Chemicals Agency to produce an action plan for a toxic-free everyday environment[12]. This includes reporting on measures needed in the period 2011 - 2014 to reduce the risk faced by people in their everyday lives of being exposed to hazardous chemicals. Reducing the chemical risks in everyday life is a step towards attaining the objective 'A Non-Toxic Environment'. The Government has decided to extend the work until 2020.

The Government proposed in 2014 new regulations on the management of marine areas [13]. The purpose is to achieve a comprehensive ocean management in order to contribute to sustainable development of the oceans. One of the government decided milestones on biodiversity and ecosystem services[10] includes protection of the marine environment and the goal is to increase the protected areas by at least 570 000 hectares until 2020.

Another milestone on biodiversity and ecosystem services [10] concerns the importance of biodiversity and the value of ecosystem services. It means that by 2018, the importance of biodiversity and the value of ecosystem services shall be widely known and integrated into economic standpoints, political considerations and other decisions in society where this is relevant and reasonably.

The aim of the recent waste prevention programme[14] is to guide and inspire stakeholders so that environmental goals are achieved, so that less waste is generated and so that products are designed which contain no dangerous substances. There are four focus areas in the programme: food, textiles, electronics and construction & demolition. It contains eight objectives and 167 measures and complements the National Waste Plan[15].

In an increasingly urbanized population experience from nature can lead to a greater understanding of nature's value for humans and for nature's own sake. In 2012 the Government presented objectives for outdoor recreation[16]. These are complementary to the environment quality objectives.

Countries and regions

Switzerland

Main themes and sectors addressed in the national State of Environment report

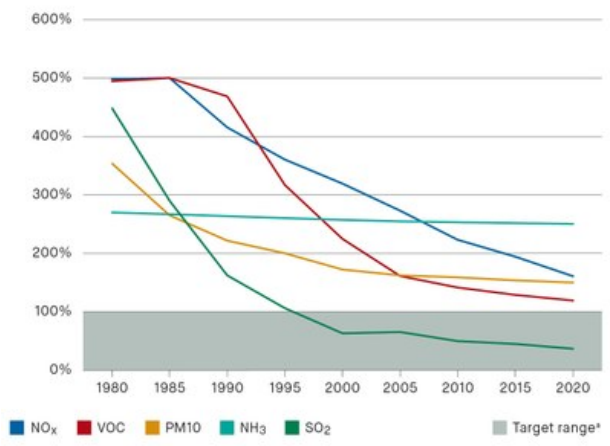
The purpose of the State of Environemnt (SOE) reports is to provide clear and accessible information about the state of the environment and the associated trends as required by Swiss law (Federal Constitution[1], Environmental Protection Act[2] and Federal Statistics Act[3]). The reporting is based on appropriate, reliable and relevant information and on validated official data. The information presented in the SOE reports can be used as a basis for environmental and sectoral policy debate.

> The SOE reports are divided into three parts: "Stocktaking of Environmental Policy Implementation" (Part I), "State of the Environment" (Part II) and "Trends and Perspectives" (Part III). Their target groups include both decision-makers and the general public. More information on the data and indicators used in the report, is available on the internet[4].

The approach taken in the SOE reports[5] is based on the DPSIR model. Thus, in addition to the environmental topics, the report also explores the main human activities that influence the environment. The following topics are examined: Natural resources, Production, Consumption, Energy, Transport, Settlements, Agriculture, Climate, Biodiversity, Air, Water, Soil, Landscape, Forest, Natural hazards, Noise, Electrosmog.

Key findings of the State of Environment report

Figure 1: Air pollutant emissions



(a) Emission range, where only precautionary measures must be taken

Source: Federal Office of the Environment

Swiss environmental policy has achieved many successes since the 1980s and reduced the pollution of the environment by certain contaminants. As a result, the country's air quality has improved considerably over the past 25 years.

However ambient concentrations of certain pollutants (particulate matter, ozone, ammonia, nitrogen oxides,) still regularly exceed the effect oriented objectives (graph 1). A large number of chemical substances (e.g. drugs, personal care products, plant protection products) are not filtered out by wastewater treatment plants and cause damage to ecosystems in the form of micropollutants.

In Switzerland, 1.6 million people are exposed to excessive levels of noise. Over 930 000 people are also exposed to excessive levels of noise at night. Despite the implementation of comprehensive measures in facilities that generate excessive levels of noise, the population is

still not adequately protected against noise. The effectiveness of noise abatement measures often fails to compensate for the increase in noise arising from the growing volumes of traffic.

The quality of surface waters and groundwater is generally good today. The input of heavy metals such as lead and cadmium by deposition from air has declined and the registration of polluted sites is country-wide achieved. Overall, there are fewer polluted sites in Switzerland than previously assumed and the programme for the remediation of contaminated sites is on target.

Since the mid-1980s, more resources are used globally than are replaced through regeneration. Switzerland consumes over twice the volume of resources that can be sustainably provided by the earth. To meet its requirements for production and consumption, Switzerland imports increasing volumes of raw materials, e.g. fuels and metals, feed and food. Imported products can be associated with very severe environmental impacts, for example when sensitive ecosystems like tropical forests are affected. Over half of the environmental impacts generated through our domestic consumption arise abroad.

The pressure on Switzerland's own natural resources is also high: the pressure on surface waters and landscape is growing through high energy consumption, increasing mobility and the constant expansion of settlement and transport areas. Soil sealing continues at an increasing rate. This is mainly reflected in the decline of biodiversity.

Switzerland could be particularly severely affected by climate change: according to new climate scenarios[6], an unchecked rise in global greenhouse gas (GHG) emissions could increase temperatures by over 6°C compared to pre-industrial times by the end of the 21st century. Despite the efforts made at the international level, it has not been possible to stem the rise in GHG emissions up to now.

Switzerland is connected with the entire world in a variety of ways: ecological, economic, social and political systems interact constantly. The pressure on important natural resources is rising throughout the world while biodiversity is in decline. The improper management of chemicals and waste, and emissions of particulate matter and ground-level ozone cause extensive impacts on the environment and health.

Main policy responses to key environmental challenges and concerns

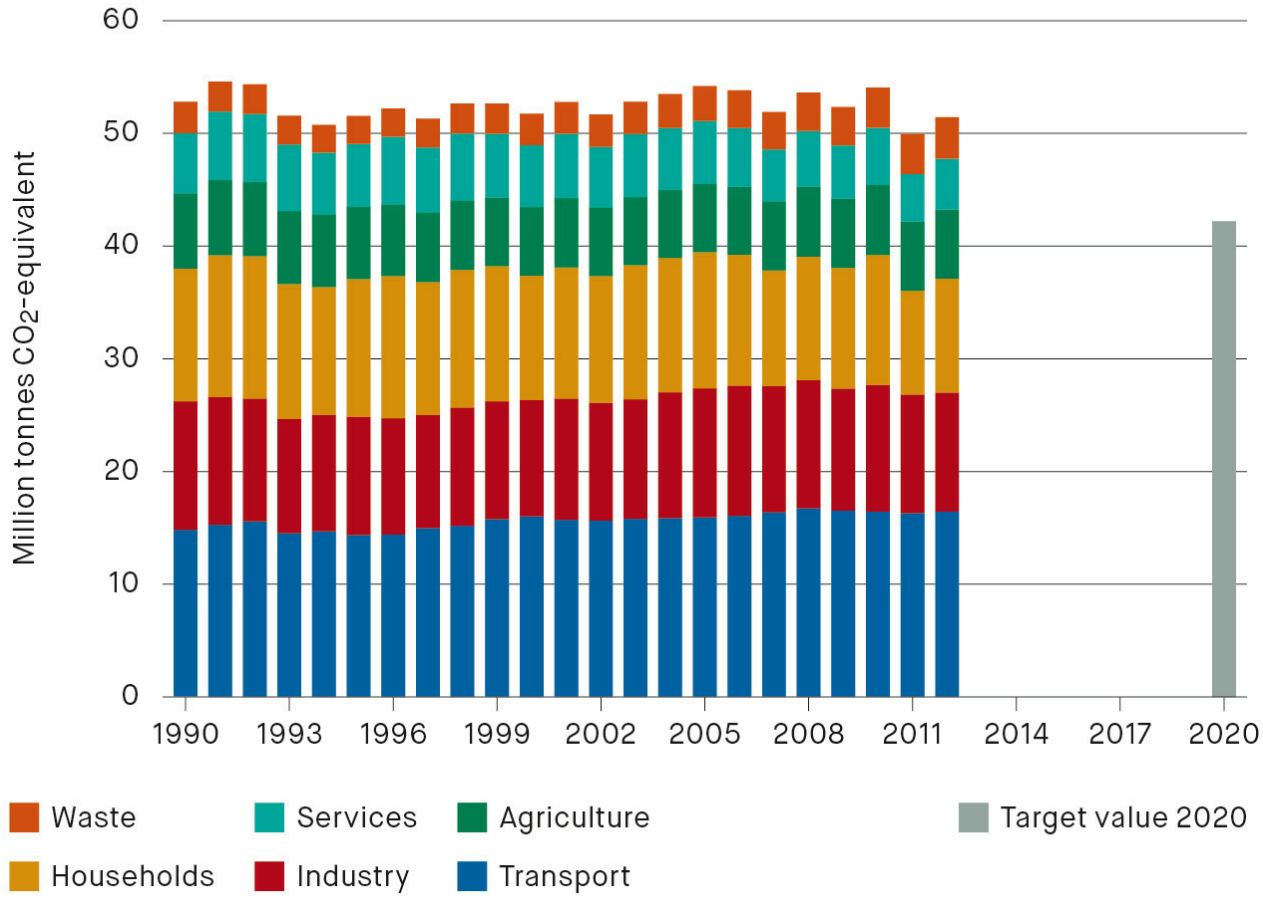
In response to the current environmental problems, the Federal Council passed the **Green Economy Action Plan**[7] in March 2013, which encompasses 27 measures proposed aiming at fostering approaches to economic activity and consumption that conserve resources.

Based on this Action Plan, the Federal Council has proposed to develop and modernize Switzerland's environmental policy through the amendment of the **Environmental Protection Act** (EPA)[8]. The amendment will establish the framework for the promotion of ecologically sound consumption patterns, the strengthening of the circular economy and the provision of information on resource efficiency. Voluntary initiatives involving business, science and society will be promoted. Given the importance of Switzerland's environmental impact abroad, its international commitment to the improvement of resource efficiency shall also be increased.

To ensure the long-term conservation of biodiversity, the Federal Council passed the **Swiss Biodiversity Strategy**[9] in April 2012. The federal authorities will develop an action plan by mid-2014 which will substantiate the strategy's objectives. An important milestone has also been reached in the area of water protection: the revised Waters Protection Act[10] contains provisions for the restoration of rivers and lakes so that they can fulfil their natural functions again and contribute to the conservation and promotion of biodiversity. The cantons[12] have already completed their strategic plans for the rehabilitation of watercourses and reduction of the negative impacts of hydropower production. The first projects are already being implemented.

However, Switzerland's decision to phase out nuclear power and the associated expansion of hydropower production make the simultaneous task of conserving or re-establishing natural habitats and landscapes a challenging one.

Figure 2: Greenhouse gas emissions by sector



For 1990 the reference value belongs in accordance with "Switzerland's Initial Report - Update following the UNFCCC Review", 2007.
Source: Federal Office of the Environment

Considerable action is also required in this area of climate change, particularly in relation to transport. Although the country has succeeded in reducing CO_2 emissions from heating fuels compared to 1990 levels, transport-related emissions have continued to increase (graph 2). Hence, the country's domestically and internationally defined emission-reduction targets could only be achieved through the purchase of emissions certificates for climate protection projects abroad.

In the revised CO_2 Act[11], which came into force on 1 January 2013, Switzerland set the goal of reducing its domestic greenhouse gas emissions by at least 20 % under their 1990 levels by 2020. At the same time, the federal authorities will also coordinate measures for adaptation to climate change. For this purpose, a **national strategy for adaptation to climate change** was developed. Its first part was adopted in March 2012. Key elements are:

1. general objectives and principles of adaptation,
2. sectoral strategies for those sectors most affected by climate change in Switzerland, and
3. a summary of the most significant challenges the country is facing in adapting to climate change.

In the second part of the strategy, adaptation measures of the federal offices are presented and coordinated in a joint action plan. It will serve as framework for adaptation for the period 2014-2019.

Country specific issues

The future state of Switzerland's environment will be influenced by global trends but steered by regional and local factors. While climate change could become more noticeable in the Alpine region than in other regions of the world (e.g. glacier recession, permafrost melt, changes in vegetation), Switzerland is currently unaffected by the **water scarcity** problems encountered elsewhere. In Switzerland, biodiversity is heavily dependent upon the implementation of the various measures set out in the Action Plan on the Swiss Biodiversity Strategy.

Switzerland could be particularly severely affected by **climate change**, as the negative impacts clearly outweigh the positive impacts in the long term. But Switzerland's robust economy can be effectively used to properly adapt to climate change and counteract its consequences for society. At the same time, due to its global business network, resource dependence and sense of ethical responsibility, Switzerland cannot disregard global developments.

Switzerland's **water prospects** seem relatively positive. Virtual water use, specifically in imported goods, is particularly important. Just like climate change, water scarcity abroad can also cause humanitarian crises that could be clearly felt in Switzerland.

Unlike in climate change, Switzerland seems to be able to steer its own future developments in **biodiversity change**. The full package of measures included in the Action Plan on the Swiss Biodiversity Strategy outlines how Switzerland will reach the targets set out by international agreements. The state of meadows, forests and bodies of water is greatly affected by their respective use in agricultural, forestry and water management activities. Switzerland's high population density compared to the rest of the world also makes settlement and transport areas a very influential factor.

In Switzerland, as in most other countries, nitrogen fluxes are significantly affected by agricultural inputs. Different target-oriented measures to reduce nitrate leaching and ammonia emissions have been introduced, but the environmental objectives are not yet achieved.

Switzerland's strong economy increases its opportunities for tackling larger environmental challenges. However, economic prosperity itself also has a dominant influence on climate, water use, biodiversity, the nitrogen cycle and other environmental compartments.

Through its current policy decisions and the measures it is now introducing, Switzerland is plotting a course for the future state of the environment. In doing so, it will need to make use of international opportunities (e.g. for binding GHG reduction targets), as well as national and local opportunities (e.g. for conserving and improving natural habitats or environmentally-friendly forms of management).

A forward-looking and comprehensive vision of natural resource management, like the one pursued by the green economy, will also be increasingly important.

Countries and regions

The Former Yugoslav Republic of Macedonia

Main themes and sectors addressed in the national State of Environment report

The adoption and implementation of national legislation demonstrates efforts to attain sustainable environmental protection. The preparations of reports are based on the "Law on Environment"[1] and sectoral laws. For the SoE reports, a "Rulebook on the form, content, targets, methodology, data sources, and report assessment"[2] was adopted.

Under Article 45 and 46 of the Law on Environment, the Macedonian Environmental Information Centre[3] develops reports and contributions to international fora. Reports include:

- Quality of the Environment report – Yearly (2013)[4]
- Environmental Indicators report - biennial (2012)[5]
- Environmental statistics - biennial (2013)[6]
- SOE – every fourth year

The Rulebook stipulates the use of Driving force, Pressure, State, Impact, Response frameworks (DPSIR), indicators, ICT tools, as well as providing analysis and interpretations.

Key findings of the State of Environment report

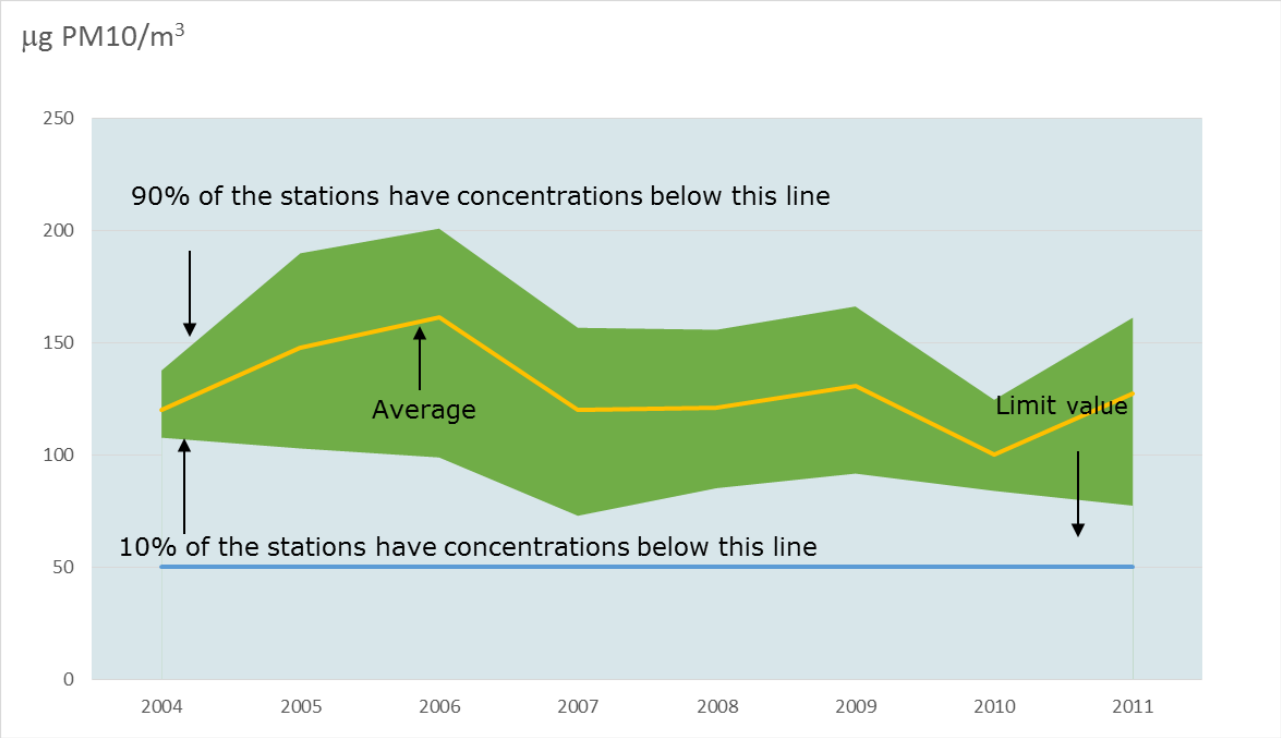
Air pollution from 2002-2011 shows a fluctuating trend for SO_2 and NO_x. Meanwhile CO and TSM increased during the period 2002-2008, and then decreased during the period 2008-2011. Emission and pollution reductions measures and programmes are not the main reason for reduction, but issues related to business practice, energy production, industrial processes, etc.

Total emissions by sectors, under the Selected Nomenclature for Air Pollution (SNAP)[7], are due to **combustion processes** (60%), **transport** (30-40%), **production processes** (30-35%), and **other** - (less than 5% due to lack of data).

Air quality shows no increase above concentration limit values and alert thresholds for SO_2, NO_x and CO. Exceedances of O_3 target values are annually recorded during summer, due increased solar radiation.

Exceedance of PM_{10} daily limit values resulted in exceedance of the annual average limit value. $PM_{2.5}$ follows the trend of PM_{10} and remains a challenge for the future.

Figure 1. Exceedance of PM_{10} daily limit values



Source: Environmental Indicators in the Republic of Macedonia 2012

Total consumption of Ozone Depleting Substances (ODS) dropped by more than 99% between 1996-2012 to only 13 tonnes of which 75% of total consumption was in the **foam** and **refrigerator** sectors. We should note that there is no domestic production of ODS.

Total emissions of greenhouse gases (GHG) between 2000-2009 decreased by 28%. The sharp decline of 12% that took place between 2008 and 2009 was due to the global economic crisis, impacting industrial production and energy demands. GHG emissions by sector are:

- energy 73%;
- agriculture 10-13%;
- waste 7%;
- industry 7%.

Water is under pressure from **climate change** and **anthropogenic** activities. Use of **freshwater resources** fluctuated during the period 2002-2011, including an increase in 2004, due to the processing industry as a principle user. Key consumers are:

- agriculture 42%;
- industry 29%;
- households 24%;
- energy production 2%.

Water supply systems are managed by public enterprises. Connection rates in urban areas are between 82%-100%. 1 200 000 inhabitants are connected to the public water supply system. In rural areas, connection rates are between 10%-100%.

Water quality is within limit values, as prescribed in the **decree for water categorization**[8]. In cities, demand for drinking water is 0.300-0.400 m^3/capita/day, while in rural areas 0.250 m^3/capita/day. The sanitary-hygienic condition of drinking water is within limit values.

Only **"Drisla"** fulfills EU Directive criteria on landfills. In 2008, 74% of collected municipal solid waste (MSW) was landfilled. This rose to 99.74% in 2012 due to increased coverage of the nationwide MSW collection system. About 1 000 uncontrolled landfills in rural areas remain a challenge.

In 2012, the share of recycled packaging was 12% of total packaging placed on the market, but recycled rate per material is:

- glass 0.31%;
- plastic 19%;
- paper and cardboard 18%;
- metal packaging 4%.

The **designated areas** target is 12% of the territory (until 2020) according to the National Spatial Plan. Currently, national parks make up 5%, natural monuments 3% and 1% multipurpose areas as part of total designated areas.

As per CORINE Land Cover, the biggest **land take** change occurs in **broad-leaved forests** which turn into transitional woodland with shrubs. This results in 45% of total changes, due wood cutting and forest fires. Meanwhile 14% of total changes are due to reforestation.

Main policy responses to key environmental challenges and concerns

> The country is in a process of EU integration, with continuous adoption and implementation of the EU Acquis.

The **Law on Environment** is the basis for environmental policy and management, thus providing guiding principles and policy instruments also.

The latest European Commission Progress Report[9] notes full transposition of the Environmental Impact Assessment, Strategic Environmental Assessment, Public Participation and Environmental Information directives. Some progress is noted under the INSPIRE Directive and the Environmental Crime Directive. There is notable progress for the NEC, CAFÉ, the Heavy Metals Directive and the VOC petrol stations and Phase II VOC directives.

In 2012, the **National Plan for the protection of ambient air quality**[10] was adopted, with measures for transport, energy, industry, agriculture, air pollution and air quality. The Programme for gradual reduction of emissions of polluting substances at national level[11], contains projections for 2012-2020 and reduction measures.

Specific policies stimulate structural industrial changes, with benefits for low energy intensive industries, improvement in technologies, equipment and systems, use of renewable energy in emission intensive areas such as households and industry.

Efforts are needed to integrate **climate change** into other sectoral policies. Legislation was adopted on consumer information on fuel consumption and CO_2 emissions for new passenger cars. The **Third National Communication on Climate Change**[12] identified 40 installations for Emission Trading Scheme activities.

Urban transport policies aim to improve flows, traffic, and the role of transport infrastructure reducing GHG. Passenger cars are the dominant mode of passenger transport, with a 77% share in total passenger km, impacting the environment and health.

Related to **water quality**,the Law on Water[13], National Water Strategy, Law on Water Economies[14], Law on Drinking Water Supply and Urban Wastewater Collection[15] and other secondary legislation have been adopted.

With the **Law on Waste Management**[16], National Waste Management Strategy 2008–2020 and National Waste Management Plan 2009–2015, EU acquis alignment continues alongside other secondary legislation.

Integrated regional waste management system is a priority and investments need to increase particularly those focusing on **waste separation** and **recycling**.

By the end of 2014 the **National Biodiversity Strategy** and Action Plan will be revised, aiming towards an integrated network for environmental monitoring and protection based on **Natura 2000**.

Monitoring and **information systems** need further development and investment, along strengthening of institutional capacities at central and local level. Coordination between institutions and public participation in decision-making has been highly emphasized.

Country specific issues

Development of national Core Set of Indicators (CSI) – in line with EEA CSI's – would allow national SoE to be assessed and benchmarked with EU countries.

Various reports or assessments are available, yet only initial steps have been taken towards a national SoE report, comprehensively elaborating within DPSIR.

The report will allow for more efficient policy creation, decision-making, public outreach and awareness for the importance of SoE, with possible **Integrated Environmental Assessment** examples and **foresight methodologies.**

Countries and regions

Turkey

The 1982 Constitution recognizes the right of all Turkish citizens to a healthy environment, as well as the duty of the State and of citizens to upgrade the environment, protect environmental health and prevent pollution. Turkey is a party to all key international environmental conventions which provide appropriate policy frameworks and promote cooperation and coherent action at global, regional and national levels to address environmental problems.

Main themes and sectors addressed in the national State of Environment report

> The last National State of the Environment Report[1], which covers the period from 2007 to 2011, consists of two main sections. The first section deals with six subjects: air, water and water resources, waste, biodiversity, land use, and institutional and legal regulations. The second section contains information on the state of environment in each of Turkey's 81 provinces. National State of the Environment Reports are published every four years.

Environmental Indicator Reports [2] [3] and Provincial State of the Environment Reports [4][5] are published annually. These two documents are the main sources of the National State of the Environment Reports.

The data for these reports is mostly provided by the Ministry of Environment and Urbanisation (MoEU), which collects the data by its own monitoring activities. Other institutions, particularly the Turkish Statistical Institute (TurkStat), are also important data suppliers for the reports. The publication of these reports is one of the duties for the MoEU by the Decree Law N.644.[6]

Key findings of the State of Environment report

Turkey has been experiencing environmental pressures due to population growth, industrialisation and rapid urbanisation. These pressures translate into a range of environmental challenges such as climate change, desertification, deforestation, water scarcity, nature degradation and marine pollution. To address these challenges, Turkey has adopted new legislation and institutional practices as part of an effort to comply with the EU environmental acquis.

Enforcement of environmental law began in the early 1980s, since which time there has been increasing regulation in the environmental sphere. This has led to improvements in a number of environmental indicators. Some of these improvements are described below:

- From 2007 to 2010, there has been a 29 % decrease in air pollution from PM_{10}, and a 43% decrease in air pollution from SO_2.
- Figures show a decrease in total water consumption by 4.4% since 2008, while there has been a 4% annual increase in the number of people served with wastewater treatment since that time.
- Between 2008 and 2010, collection of municipal waste increased by 3.8%. Regarding waste sites in urban areas in Turkey, the number of landfills which was 15 by 2001 rose to 38 in 2008, 59 in 2011, and 69 in 2012. Between 2009 and 2010, there was a 25% increase in the amount of hazardous waste treated.
- Turkey is a centre of genetic diversity for plants. In Turkey, out of 11 466 taxons of species and sub-species, 3

650 are endemic. Moreover 8.1% of the total surface area of Turkey is protected.

- According to the 2000 and 2006 CORINE studies, artificial areas in Turkey increased from 1.56% of the territory to 1.61% between 2000 and 2006, while the share of land covered by forests and semi-natural land remained roughly the same.

Table 1: Land use and land cover data for Turkey

	Corine 1990	Corine 2000	Corine 2006
1. Artificial Surfaces	1.23%	1.56%	1.61%
2. Agricultural Areas	42.92%	42.60%	42.34%
3. Forests and semi-natural areas	54.0%	53.89%	54.04%
4. Wetlands	0.33%	0.31%	0.36%
5. Water Bodies	1.52 %	1.64 %	1.64 %

Main policy responses to key environmental challenges and concerns

Turkey has achieved progress in waste management, noise control, industrial pollution control and risk management, forestry, erosion control, and in the quality of its water and air. However, additional legislative and institutional efforts need to be made in the fields of nature protection, chemicals, climate change and water management.

Turkey's convergence with the EU environmental acquis requires comprehensive and costly investment, both in human and institutional capacity development as well as in infrastructure for activities such as environmental monitoring, inspection and reporting. An Annual Inspection Report for Turkey has been published since 2009. [7]

Turkey confronts the challenge of ensuring the integration of environmental protection and social inclusion into its plans for economic growth. Turkey's Tenth Development Plan (2014-2018)[8] puts sustainability at the core of its development endeavours. The plan promotes, inter alia, eco-efficiency and cleaner technologies in production processes and in the services sector. Turkey has been diversifying its energy mix by increasing the use of renewables. Today, renewables constitute 20% of power generation capacity in Turkey.

Turkey is a party to all key international environmental conventions, which provide appropriate policy frameworks and promote cooperation and coherent action at global, regional and national levels to address environmental problems.

Regional Sea Conventions for the Black Sea and Mediterranean are major policy instruments for Turkey to protect the marine and coastal environments of these valuable ecosystems.

Turkey has developed and implemented a number of strategy documents for sectors such as mitigation and adaptation to climate change, conservation and sustainable use of biodiversity, erosion control and combating desertification, reforestation, and afforestation. New strategy documents regarding different aspects of biological diversity are also being prepared.

Country specific issues

Turkey has a unique and exceptionally rich biodiversity.[9] Turkey consists of different micro-climatic zones and biogeographic regions, each with its own natural ecosystems. Turkey is rich both in terms of its flora and fauna species, many of which are endemic.

Turkey is located at the intersection of the Mediterranean and Near Eastern gene centres, which makes its genetic diversity important. There are five micro-gene centres in Turkey, which offer very important genetic resources for the future sustainability of many plant species cultivated across the world. In terms of animal genetic resources, many domestic animal races were originally bred in Anatolia and spread to other regions of the world.

Turkey is also one of the leading countries for plant endemism. About 33% of the plant species are endemic to Turkey. The exceptional amount of endemism places great responsibility on Turkey to ensure that these species are adequately protected so as not to become endangered or extinct.

According to the OECD Environmental Performance Review of Turkey[10], protected areas reached 5.3% of Turkey's area during the review period. Turkey has further improved protection of these areas via management plans.

The proportion of protected areas (included RAMSAR Sites) to the total surface area of Turkey has increased significantly over the years. Turkey plans to augment this proportion to 10%.

Furthermore, forest areas of Turkey have increased as well, thanks to comprehensive afforestation campaigns, which also contribute to efforts to combat desertification.

Turkey's rich biodiversity is highly vulnerable to climate change, which is also putting pressure on its limited water resources. Turkey is not a water-rich country and water resources are not distributed evenly in the country. In this context, effective and integrated management of water resources is of great importance for Turkey.

According to the Fourth Assessment Report of the IPCC [11], future climate change could critically undermine efforts for sustainable development throughout the world and especially in the Mediterranean Basin.

Turkey is located in the eastern Mediterranean region where countries are in the highest risk group. Therefore, Turkey is compelled to immediately adapt itself to the adverse impacts of climate change.

Turkey has the lowest levels of per-capita GHG emissions among the OECD countries. Likewise, Turkey's emissions per unit of GDP is below the OECD and world average. Besides, Turkey's historical contribution to atmospheric accumulation of GHG emissions is extremely low.

> Turkey is committed to combating climate change in accordance with the principles of "common but differentiated responsibilities" and "respective capabilities". Turkey intends to increase its efforts through not only domestic measures but also bilateral and multilateral cooperation and support.
>
> The special circumstances of Turkey, which are recognised by the United Nations Framework Convention on Climate Change, makes Turkey eligible to access current and future technology, capacity-building mechanisms, and finance mechanisms under the UNFCCC for adaptation and mitigation.[12][13]

Countries and regions

United Kingdom

Main themes and sectors addressed in the national State of Environment report

Responsibility for the environment is devolved to the four different administrations [1]: the Northern Ireland Assembly; the Scottish Government; the Welsh Government; and within England, the Department for Environment Food and Rural Affairs and the Department of Energy and Climate Change. There is no single State of Environment (SOE) report for the United Kingdom (UK). This is a summary of independent country level key products.

- **England:** England Natural Environment Indicators[2]; Sustainable Development Indicators[3]
- **Northern Ireland**: From Evidence to Opportunity[4]; Northern Ireland Environmental Statistics Reports[5]
- **Scotland**: SEWeb[6]
- **Wales:** SOE Report for Wales[7]

All reports use an indicator based approach but the methodology, in particular the assessment period, differs. For each part of the UK a document containing more detailed analysis has been uploaded onto the European Environment Agency's SOE platform[8].

The results presented here are primarily from existing UK level reports[3],[9],[10], supplemented by additional data sources[11].

Key findings of the State of Environment report

Energy and Climate Change

There has been a steady overall decline in carbon dioxide (CO_2) and other greenhouse gases (GHGs) generated in the UK over the past 20 years. Emissions of CO_2 fell by 20% and emissions of all GHGs by 26% in the period 1990-2012[12]. Emissions resulting from UK consumption[13] rose in the period 1993-2004, partially due to an increased reliance on imports. By 2010 this had fallen compared to the 2004 peak, possibly due to the global financial crisis.

Total primary energy consumption for the UK fell by 7% in the period 1990-2012 to its lowest level since 1985. There have been changing levels of energy consumption by sector over time e.g. the industry sector was responsible for 17% of total final UK consumption in 2012 compared to 40% in 1970.

A UK Renewable Energy Roadmap was published in 2011. The UK is making progress towards meeting the target to deliver 15% of its energy consumption from renewable sources by 2020. Between 2005 and 2012 the proportion of final energy consumption from renewable sources reached 4.1%.

Measurable impacts of climate change have been recorded across the UK. On average the UK is getting warmer [14]. Precipitation totals have not changed significantly.[15] There have been increases in sea levels and sea-surface temperatures[16].

Waste and Resource Use

Waste is viewed as a potential resource. Increased rates of reuse, recycling and energy recovery have resulted in a lower proportion of waste being disposed of in a way that causes environmental damage.

In 2013 the amount of household waste recycled, composted and reused was almost four times what it was in the period 2000-2001, but the rate of increase has slowed in recent years. Local authorities benchmark their waste management performances against each other using our 'WasteDataFlow' portal [17] which is expected to lead to further improvements. In 2011 about 90% of UK construction and demolition waste was recovered. In 2012 biodegradable municipal waste to landfill had been reduced to under 35% of the level in 1995. A charge on single-use carrier bags is in place in Wales (2011), Northern Ireland (2013) and due in Scotland (October 2014). The former resulted in around an 80% reduction in consumption of supermarket bags. A charge on single-use plastic bags will come into force in England in October 2015.

Fresh Water and Marine Environment

Our rivers and lakes are generally in moderate to good condition and there have been reductions in pollution over the past 25 years. The main issues are:

- Loss of habitat as a result of development (historic and ongoing);
- Rural diffuse pollution causing nutrient enrichment and habitat loss;
- Energy production disrupting the natural movement of water.

We are addressing these issues and progress will be reflected in updated River Basin Management Plans.

The main pressures on the marine environment are damage to and loss of habitat on the seabed from fishing and the presence of physical structures[18].

In 2011, 47% of 15 assessed fish stocks around the UK were at full reproductive capacity. Other points to note include:

- Populations of breeding seabirds have increased significantly over the long-term but decreased in the short-term (2007-2012).
- Populations of seabirds and harbour seals are declining in some areas.
- Contamination by hazardous substances (e.g.heavy metals) has reduced in most regions and there are few or no problems relating to radioactivity, eutrophication, or algal toxins in seafood.
- Litter, particularly plastic is found on beaches, in the sea and on the seabed.

Air Quality

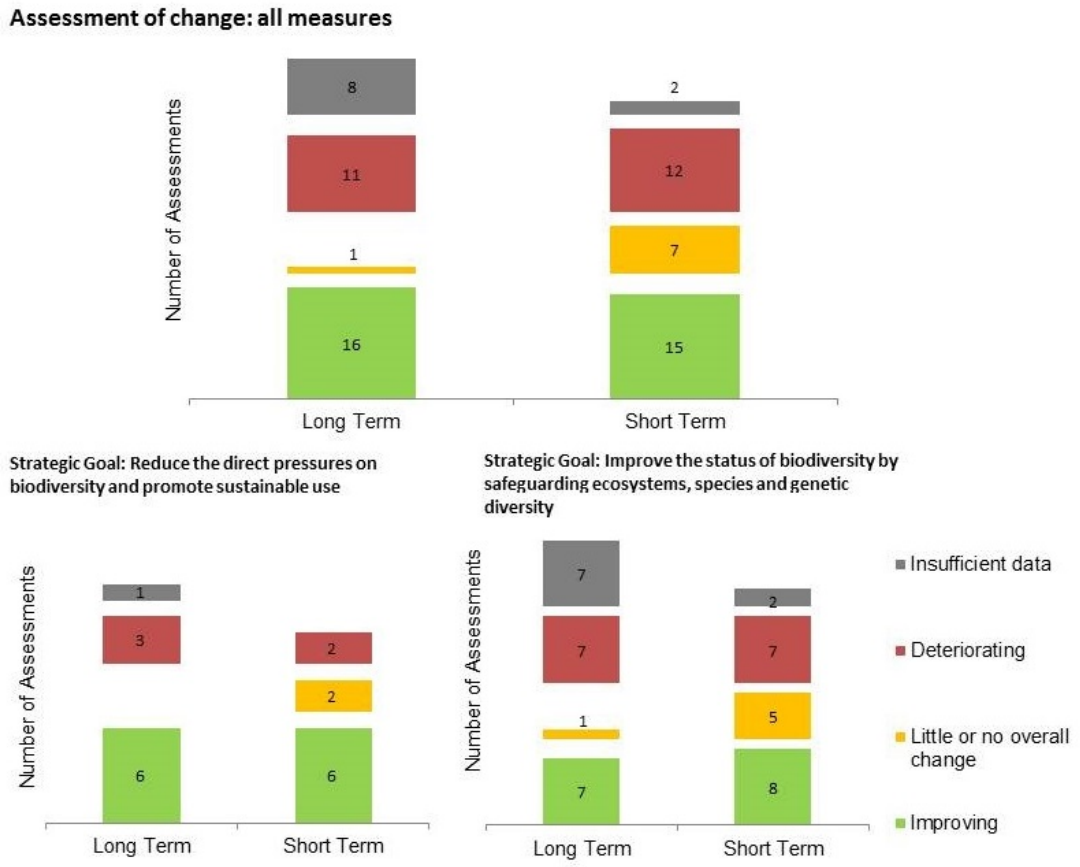
Emissions of air pollutants continue to show downward trends, with many reducing year-on-year. The area of sensitive habitat exceeding critical loads for acidification and eutrophication[19] significantly decreased in the period 1996-2010.

The number of days when air pollution is defined as "moderate or higher"[20],[21] indicates how often air pollution is raised to levels when there is an increased risk of health effects from short term exposure. Northern Ireland has seen a long-term decline in number of pollution days. In England the average number of pollution days[21] in urban sites fell from 15 to 14 in the period 2010-2013, and rose from 10 to 16 in rural sites. There is no clear trend for Scotland or Wales.

Biodiversity

An agreed set of indicators[9] is used to track progress in relation to global targets at the UK level. Assessments covering the most recent 5 years for which comparable data are available show: 15 measures improving; 12 deteriorating; and 7 not changing (Figure 1). A number of measures show short term dips in a longer term increasing trend, e.g. volunteer participation and public expenditure.

Figure 1: Assessment of change: all measures (top) and two strategic goals (lower left and right).



Progress is being made in addressing some of the main drivers of biodiversity loss and in taking specific action to conserve biodiversity. However there are declines in aspects of biodiversity, specifically breeding farmland birds, priority species, and habitats of European importance.

During the period 1970-2012, populations of breeding farmland and woodland birds in the UK declined by 50% and 17% respectively[9]. In 2012 the population for breeding water and wetland birds was 16% lower than in 1975.

The UK has EU-level conservation responsibilities for a number of threatened species; in 2013, 39% of these species were in favourable conservation status, up from 26% in 2007[9]. In 2013, the conservation status of 10% of species was improving, including the large blue butterfly and Green Shield moss, but the status of 15% of other species was declining.

The UK also has EU-level conservation responsibilities for 77 habitats in the Atlantic Biogeographic Region. In 2007, 5% of habitats listed on Annex I of the Habitats Directive in the UK were in favourable conservation status, declining to 3% in 2013[9]. In 2013, the status was improving for 31% of the habitats and declining for 25%.

Main policy responses to key environmental challenges and concerns

There has been ongoing progress in implementing published commitments within each of the UK administrations to deliver a healthy natural environment.

Key measures include the following.

- **Leading the way**: the 2008 Climate Change Act established the world's first legally binding climate change target. its aim is to reduce the UK's GHG emissions by at least 80% (from the 1990 baseline) by 2050. Restrictions are placed on the total amount of GHGs the UK can emit over five year periods. The UK has set the first four carbon budgets in law, covering the period from 2008-2027, and committed to halving emissions relative to 1990 during the fourth carbon budget period (2023-2027).
- **Delivering a shared agenda**: through working in partnership with EU Member States to take action with reform of the Common Agricultural and Common Fisheries Policies; taking action to stop biodiversity loss, the illegal trade in endangered species, deforestation and illegal logging through implementation of Nagoya commitments on biodiversity; and contributing financially to international mechanisms.
- **Sustainable growth**: combining regulatory controls for emissions, innovative technology and funding to protect and conserve the rural environment. There are initiatives such as land management schemes which provide funding to farmers and other land managers (based on income forgone) to deliver effective environmental management on their land. Also, setting up the Natural Capital Committee to advise Government, developing national natural capital accounts and other action to support creation of new markets for green goods and services.
- **Public participation and access to information**: providing comprehensive insight into the condition of the UK environment with the dual aim to maximise the opportunities for public engagement and provide a means for the public to identify the environmental problems they consider to be the most important.

The UK is seeking to create a better natural environment and is putting in place foundations for a change in culture and behaviours. This cannot be done by government alone; individuals, businesses, community groups and Non-Governmental Organisations need to work collaboratively to achieve this ambition.

Countries and regions

Arctic region

Brief introduction

The Arctic region consists of the partly ice-covered Arctic Ocean and land areas of the surrounding eight Arctic states; Canada, Denmark (including the Faroe Islands and Greenland), Finland, Iceland, Norway, Russian Federation, Sweden and the US (Alaska) as well as their shallow sub-regional seas. The Arctic is home to and provides livelihoods for four million people, most of whom live in northern Scandinavia and Russia. This includes three indigenous peoples; the Sami, the Inuit and the Nenets in the European part of the Arctic[1]. The Arctic region is an area of growing strategic importance in terms of increasing access to natural resources and new transport routes as ice and snow conditions are undergoing rapid change. Economic developments are accelerating which can be beneficial for the region and the global economy, yet they will also have repercussions on the Arctic's fragile environment if not managed with care. The Arctic has therefore been identified as a focus region for the European Union (EU) in the 7th Environment Action Programme (7th EAP)[2]. In the Arctic context, the EU maintains strategic partnerships with Canada, Russia and the USA, and has close partnerships with Greenland, Iceland and Norway[3].

The region is varied in many aspects and many parts are characterised as being relatively clean and remote. The high Arctic has an extreme environment and many areas lack infrastructure. An exception to this can be found in the more populated and developed parts of northern Scandinavia and northwest Russia. The overall level of economic activity is still relatively low although it has been increasing in recent decades in certain areas. The region's economy and resources now play a role in a global perspective[4]. This role could increase if the region's potential in natural resources, shipping and tourism are exploited further. This may lead to improved local living conditions and create growth and jobs[5]. Arctic states and international partners are working to ensure a prudent development that limits further Arctic warming or jeopardizing ecosystem resilience. The sensitive Arctic environment is already challenged by rapid changes such as climate change, biodiversity loss and hazardous substances transported over long distances that influence human health. Arctic warming affects traditional ways of life of indigenous peoples, puts stress on ecosystems and can have global implications. Climate change is therefore a threat in terms of Arctic ecosystem resilience and functions[6]. It is also a challenge with regards to ensuring timely adaptation measures, while mitigation efforts are strengthened at a global scale. The EU has increasingly recognised that European activities affect the Arctic environment and that Europe in turn will be influenced by the changes that occur in the region.

In 1991, environmental cooperation in the region was formalised in the Environmental Protection Strategy for the Arctic[7] which in 1996 became the Arctic Council, composed of the eight Arctic states and six Permanent Participants that represent indigenous peoples. It has six working groups coordinating assessments and studies which contribute towards the overall vision of promoting sustainable development in the region. Five member countries of the European Environment Agency (EEA) are members of the Council and seven are observers[8]. The EU is allowed to observe proceedings in the Council until a final decision is made on its application to become an observer[9]. The key challenges facing the region, which are also reflected in the 7th EAP and the EU's Arctic policy (currently under development) can be summarised as follows:

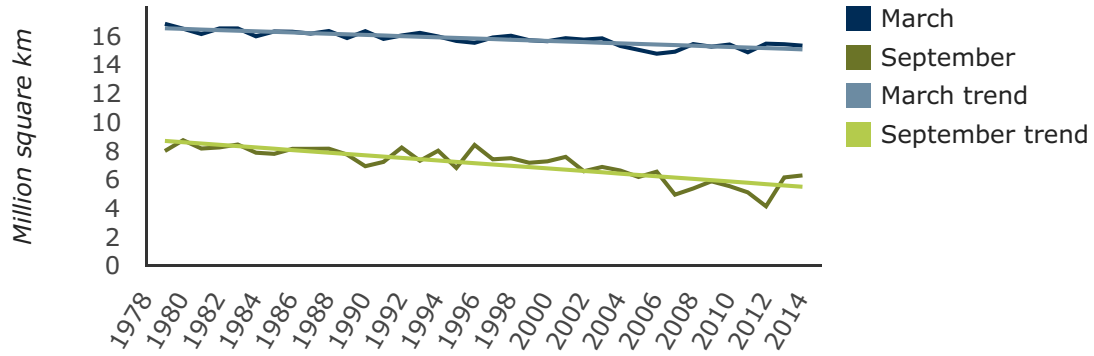
- increasing economic development of the Arctic;
- global climate change and its rapid effects on the Arctic;
- policy developments and international cooperation related to the Arctic.

What are the main problems/threats related to the Arctic region?

Major economic activities take place in the region. Sub-regional Arctic seas now represent more than 10% of global marine fisheries, including large catches in the European part[10]. Similarly, the production of hydrocarbons has increased, including in the Barents and Norwegian seas[11], and about 22% of the world's natural gas and 10% of oil are produced in the Arctic[12]. In 2012, Russia and Norway alone provided more than half of the EU's oil and gas imports[13], much of which was produced in the Arctic region. Arctic shipping is increasing, most significantly to and from Arctic ports but also in trans-Arctic voyages. The Northern Sea Route along the Russian coast has seen an increase from four trips in 2010 to 71 in 2013[14]. Meanwhile, the Northwest Passage through Canadian waters increased from two trips in 2009 to 18 in 2013[15]. In certain areas, Arctic cruise passenger ships are also increasing in numbers and size. These ship numbers are small when comparing globally but with retreating sea ice, there is potential for an increase in trips with shorter travel routes for parts of the year. Sea-based activities in the Arctic are challenging due to waters with varying ice-cover, lack of sea charts, light conditions in winter and remoteness in case of accidents. Remoteness is also a problem when tackling potential pollution incidents.

The region plays a vital role in the Earth's climate system and energy balance. As reflective snow and ice diminish, due to Arctic warming or black carbon deposits [16], solar energy is increasingly absorbed in the ocean and land area. The Arctic is experiencing rapid warming compared to other parts of the globe[17] causing extensive loss of sea ice [18] (see Figure 1) which in addition to ocean warming has implications for ice-dependant species[19] and for ocean acidification since open waters absorb more CO_2 from the atmosphere[20]. The increase in average temperatures since 1980 has been twice as high over the Arctic as it has been over the rest of the world[21]. As a consequence, snow cover has been declining up to 53% in summer[22] and the Greenland ice sheet has been losing mass at an accelerated rate (almost tenfold in the past two decades)[23]. This massive loss of ice from the Greenland ice sheet contributes to global sea-level rise[24] which over the next century will leave coastal areas at risk with regards to people, economic assets and coastal ecosystems, including in Europe[25].

Figure 1: Arctic sea-ice extent



Note: Between 1979 and 2014, the Arctic lost on average 42 000 km ^{2} of sea ice per year in winter and 91 000 km ^{2} per year at the end of summer. The decline in summer sea ice appears to have accelerated since 1999. Trend lines and observation points for March (the month of sea-ice extent maximum) and September (the month of sea-ice extent minimum) have been indicated. This figure does not reflect the loss of sea ice thickness, which has also been declining over the same period. Data delivered through MyOcean.

Data sources: a. EUMETSAT OSI SAF. Sea ice extent b. CryoClim. Sea ice extent c. EEA – Indicator CLIM010

European Environment Agency

Warming conditions thaw permafrost damaging infrastructures and transport systems. Melting permafrost is also a significant source of CO_2 and methane to the atmosphere and these emissions can be of significance with regard to keeping global temperature change below a 2 °C increase, as agreed under the UN Framework Convention on Climate Change (UNFCCC)[26].

The region is home to a number of sensitive marine and terrestrial ecosystems[27], some of global importance, as the Arctic is a breeding ground for a number of migrating species. More than half of the world's wetlands are in the Arctic and sub-Arctic region[28]. Climate change is the most serious threat to Arctic biodiversity, not least as the UNFCCC upper limit of 2 °C global warming is projected to result in a temperature increase of 2.8 to 7.8 °C in the Arctic, with severe impacts to biodiversity[29]. Arctic species and ecosystems are also affected by pollution (especially persistent organic pollutants (POPs)[30] and mercury[31]) and marine litter from long-range transport and local sources. Some pollutants accumulate in the food web[32], as cold conditions slow down the degradation processes, while others are absorbed in fatty tissues and released into the animals during the natural seasonal starvation. Local communities with a diet derived mainly from local marine food items are exposed to these pollutants with subsequent health implications.

International efforts have been made in Arctic observation and monitoring, such as the ongoing Circumpolar Biodiversity Monitoring Programme (CBMP)[33] and the Trends and Effects Monitoring Programme[34], along with the associated pollution assessments under the Arctic Council and the recent International Polar Year[35]. However, there are still many unknowns when it comes to growth in economic activities, forecasting the rate of change, assessing ecosystem responses or understanding the interactions between various drivers of change and their cumulative impacts.

What are the main policy responses to key challenges?

Nationally, Arctic states already have legislation in place to regulate economic developments taking place on their territories. Regionally, the Arctic Council has adopted legally binding agreements regarding search and rescue[36] and oil spills[37] and is making recommendations for policy responses on the basis of scientific assessments. Internationally, a number of conventions and protocols have been put in place to regulate harmful substances such as POPs or mercury[38], to regulate economic activities like shipping[39] or provide guidelines for activities including off-shore oil and gas[40].

In an EU context, the 2014 Council Conclusions for the Arctic[41] call for strengthened EU environmental protection in the Arctic. The EU has demonstrated willingness to contribute actively towards such efforts. Investments in satellite observations in the region[42] and the EU Framework Programme for Research and Innovation (Horizon 2020[43]) will significantly contribute to a better understanding of relevant developments and processes. This includes improved knowledge on the resilience of Arctic ecosystems and identifying potential tipping points which can have large-scale impacts. Such work will help the EU and its partners address some of the potential serious impacts on Europe from a changing Arctic such as from sea-level rise and extreme weather events from climate change. International scientific cooperation has increased, promoting free and open access to data and avoiding costly duplication, thereby reducing costs while strengthening the knowledge base. The Sustaining Arctic Observation Networks (SAON) initiative[44] and the CBMP are positive steps in that direction.

The Council of the European Union has requested that an integrated and coherent EU Arctic policy be presented by December 2015 building on three overarching objectives proposed by the Commission, namely; i) strengthening the knowledge base to address the challenges from environmental and climate changes; ii) contributing responsibly towards a sustainable development in the region; and iii) intensifying constructive engagement with Arctic states, indigenous peoples and partners regarding challenges that require an international response[45]. This policy will complement existing EU environmental and climate policies which are of relevance in addressing Arctic challenges. The size of any future EU Arctic footprint will be lower if EU Member States are able to adhere to agreed targets, such as reducing greenhouse gases by 40% before 2030 and 80% before 2050 (global emission reductions are also needed)[46], phasing out long-range polluting substances, or moving towards a more resource-efficient and circular economy.

The importance of the Arctic to Europe's environment has been recognised by the EU for some time. The EEA has published a number of reports dedicated to the Arctic[47] and in 2010 the EU produced an EU Arctic footprint report[48] as a response to the geopolitical and environmental changes in the region. Most recently, in 2014, the EU funded a strategic assessment of development in the Arctic[49] with recommendations on how the EU could respond to challenges identified in the assessment. At national level, a dozen EEA member countries are involved in ongoing environmental monitoring and assessment work in the region. These efforts, together with the work of the Intergovernmental Panel on Climate Change (IPCC)[50] and other Arctic partners, have raised the level of understanding of the processes, changes and drivers at play as well as providing data, including some used in EEA indicators[51].

What are the main challenges ahead?

One of the societal challenges will be to balance global energy demands with the need for environmental protection of a sensitive area while not dismissing local and indigenous communities the opportunity for jobs, development, improved living conditions and health standards. Estimates indicate that 13% of undiscovered oil and 30% of undiscovered gas can be found in the Arctic[52]. Utilising these resources would challenge the transition to a low-carbon society, as outlined in the 7th EAP, since it is recommended that two-thirds of known global fossil resources must remain in the ground if the UNFCCC 2 °C target is to be achieved[53]. An important step in the right direction will be if an ambitious global legally binding agreement on mitigation and adaptation is reached at the UNFCCC's 21st Conference of the Parties (COP 21) meeting in Paris in 2015. Addressing black carbon emissions in and beyond the Arctic similarly requires an international and regional response, and steps are being taken under the Climate and Clear Air Coalition to Reduce Short-Lived Climate Pollutants[54], where a number of countries and the EU have committed to mitigate short-lived climate pollutants including black carbon.

Regarding Arctic shipping, further international cooperation is needed to ensure it is safe and clean. Preventing and responding to potential oil spills or search and rescue operations still remain major challenges. An agreement on marine oil spill prevention in the Arctic is expected to be adopted by the Arctic Council and full implementation of such an agreement can address some of the concerns. It remains essential to ratify and implement the International Maritime Organisation's Convention on ballast water management[55] by all coastal states to reduce the risk of introducing alien species in the ecosystems in the Arctic Ocean and sub-regional seas. With increased Arctic shipping, the establishment of support infrastructures, including icebreakers and port facilities, along the northern shipping routes will be needed as well as addressing use and carrying of heavy fuel oils in the Arctic.

It will be a challenge for local and indigenous communities in the region to adapt to climate change. The Arctic Council is currently developing a knowledge base[56] on how drivers interact with and affect people and nature. Adaptation actions, including in the Barents region, are being explored as a key component. Adaptation strategies and best practices are being collected and shared in the EU Climate-Adapt platform[57] as part of the EU strategy on climate change adaptation. The establishment of more protected areas to conserve the region's unique and climate-sensitive wildlife and culturally historic sites, while allowing for local growth and development, is also needed. If appropriate strategies with prudent and integrated management plans are implemented at an early stage, the region can contribute significantly towards the 2050 vision of environmental sustainability as outlined in the 7th EAP.

Countries and regions

Black Sea region

Brief introduction

The Black Sea region has become an area of particular interest to the European Union (EU) not only due to the accession of Bulgaria and Romania but also because it is a transit area for oil and gas resources from Russia and the Caspian Sea. Due in part to its strategic importance, the area is also subject to political conflicts and tension as currently observed in Ukraine. The area covers two EU Member States, Romania and Bulgaria, and one candidate state, Turkey. It also includes the Russian Federation, as well as a number of countries covered by the European Neighbourhood Policy: Ukraine, Georgia, Moldova, Armenia and Azerbaijan.

The Black Sea has distinctive natural conditions, with over 90% of its deeper water volume consisting of anoxic water[1]. The interaction between the oxygen rich surface waters and the Black Sea's deeper areas tends to be limited. This leads to a layering structure being created which affects the diversity of the organisms within the Black Sea.

The Black Sea's catchment area is very large, with a total surface area of around 2 million km^2, five times the surface of the Black Sea itself. Some of Europe's longest and largest rivers flow into it including the Danube and the Dnieper. The population living around the Black Sea coast is unevenly distributed and includes over 12 million inhabitants in the metropolitan area of Istanbul; two large cities Odessa (Ukraine) and Samsun (Turkey) each with 1.2 million inhabitants; and several smaller cities with 300 000 to 450 000 inhabitants each: Constanta (Romania), Trabzon (Turkey), Sochi (Russia), Varna (Bulgaria), Sevastopol (Ukraine) and Novorossiysk (Russia).

The Black Sea ecosystem has been the subject of intense scrutiny[2]. Changes to its ecosystem during the last 50 years clearly indicate its vulnerability to the anthropogenic effects. Marine resources in the Black Sea have declined due to over-fishing, unplanned development of coastal zones and intense maritime traffic. Meanwhile unique terrestrial ecosystems, such as those in the Caucasus region, the Danube Delta and the East Carpathians are also under threat[3].

The Black Sea Convention[4] (BSC) provides a regional cooperation framework to protect against pollution. It entered into force in 1994. Following the accession of Romania and Bulgaria to the EU, the Black Sea became the focus of various EU policies, both thematic (e.g. Fishery, Integrated Coastal Zone Management (ICZM), Marine Strategy Framework Directive (MSFD), Water Framework Directive (WFD), Habitat and Birds Directives); and horizontal such as Environment Impact Assessment/Strategic Environment Assessment (EIA/SEA), access to environment information, control of major-accident hazards involving dangerous substances (SEVESO)[5].

In 2009, an updated Black Sea Strategic Action Plan (BS SAP) for the Rehabilitation and Protection of the Black Sea[6] was adopted by all coastal countries. Based on an ecosystem approach and coherent with MSFD provisions, the plan aims to resolve transboundary environmental problems. It contains 'realistic' targets, including legal and institutional reforms, as well as suggestions as to the necessary investments to solve the main environmental problems identified by the Black Sea Transboundary Diagnostic Analysis (BS TDA) report published in 2007.

The key transboundary challenges of the Black Sea region are as follows:

- eutrophication/nutrient enrichment;
- changes in marine living resources;
- chemical pollution (including oil); and
- biodiversity/habitat changes, including the introduction of alien species.

These four priority areas have also been acknowledged and analysed in the context of the last State of Environment Report for the Black Sea[7] released in 2008. Since this report has not been updated, it is difficult to assess recent progress in relation to the aforementioned challenges. Moreover, the monitoring activities behind the data used are not systematic, and in some cases not comparable between institutions and countries, with some important parameters yet to be measured.

A number of projects have been put in place to address these and other issues — an overview of the most recent and relevant projects is presented in Table 1.

Table 1. Recent Black Sea environment-related projects

Period	Ongoing projects	Topic	Donors
2009-2011	BlackSeaScene	On-line access to in-situ and remote sensing data, meta-data and products	EU
2009-2010	MONINFO	Monitoring and reduction of oil pollution in the Black Sea.See also: Presentation, MONINFO Project.	EU
2009-2013	EnviroGRIDS	Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development and contributing to Global Earth Observation System of Systems (GEOSS)	UNEP-ICPDR
2009-2014	MSFD Project	Harmonisation with the Marine Strategy Framework Directive	EU
2010-2014	PEGASO	Integrated Coastal Zone Management (ICZM)	EU
2010-2014	SEA-ERA	Integrated Marine Research Strategy and Programmes	EU-ERA-NET Scheme
2011-2013	Baltic2Black	Focusing on nutrient pollution and eutrophication, through transfer of related existing best practices from other regions, in particular the Baltic Sea	EU
2011-2014	CREAM	Ecosystem approach to Fisheries, management advice in the Mediterranean and Black Sea	EU
2012-2016	CoCoNet	Marine protected areas coupled with sea based wind energy potential	EU
2012-2015	PERSEUS	Assessing the dual impact of human activities and natural pressures on the Mediterranean and Black Seas	EU
2012-2014	MISIS-MSFD	Black Sea integrated monitoring system	EU Ministries of Environment in selected countries
2013-2014	EMBLAS	Improving Environmental Monitoring in the Black Sea and strengthen the capacities of Georgia, Russian Federation, Ukraine for biological and chemical monitoring of water quality in the Black Sea, in line with EU water related legislation	United Nations Development Programme (UNDP) and the joint EC/UNDP Project

What are the main problems/threats related to the Black sea region

Land-based sources are the biggest polluters and account for more than 70% [8] of all pollution. Eutrophying[9] nutrients, which enter the sea through rivers, are one of the worst pollutants. Meanwhile, nutrients coming from the Danube River (mainly nitrates) remain significant but stable during recent years [10].

Oil pollution in the Black Sea remains an ongoing concern along major shipping routes and in coastal areas around river mouths, sewage outputs, industrial installations and ports. There is no evidence of significant heavy metal, pesticides and other persistent organic pollutants in surface waters, although elevated levels of these substances can be found around industrial centres, large cities and ports [12].

The wider Black Sea area is becoming increasingly important for energy production, transportation and distribution. The role of the Black Sea region, as a transit route of major oil and gas exports, is expected to increase as are the risks associated with these activities, such as oil spills, or accidental pollution. Around 50 000 ships sail through the Bosphorus every year, including at least 10 000 oil tankers [13]. Several Black Sea ports in Russia and Georgia are terminals for oil and gas pipelines from the Caspian Sea. While bringing jobs and economic development, the increase of oil transport/transit and handling operations, if not regulated and systematically monitored, could put additional pressure on the already fragile ecosystem of the region.

There are considerable stocks of hydrogen sulfide and gas/oil available in the depth of Black Sea which serve to underline the increased economic significance of the region. The full-scale extraction of some of these resources will require the development of new and more complex technologies. In addition, the long-term impacts of such large scale activities will have to be carefully assessed given the potential consequences on the marine ecosystem.

The fish stock has deteriorated dramatically over the past three decades. The diversity of commercial fish caught has decreased over this period from about 26 species to 6. The volume of fish caught has actually increased, despite a near collapse in 1990. This is almost entirely due to significant anchovy fishing by Turkey, accounting for almost 80% of the total catch [14]. The main factors behind the decline of fish stocks are: changes to the ecosystem as a result of eutrophication; the arrival of alien species and overfishing. Illegal fishing in the Black Sea is rapidly increasing[15], affecting both the marine biodiversity as well as economic activities in the region, in particular the fishing industry [16].

The introduction of alien species, for example the rainbow comb jelly fish (Mnemiopsis leidyi), has severely affected the marine biodiversity [17]. The majority of these alien species reached the Black Sea via shipping activities (ballast water) or through migration from the Mediterranean Sea, possibly as a result of climate change. Some were even introduced through aquaculture activities. Ballast water continues to be discharged into the sea despite existing national regulations [18]. Russia has been party to the ballast water management convention [19] since 2012 and Turkey is in the final stages of ratification. This global convention is not yet in force[20].

What are the main policy responses to key challenges / environmental concerns in relation to these issues?

There are two key problems concerning the Black Sea region and its environmental problems. The implementation of commitments derived from the existing legal framework remains problematic and the adoption of new instruments is moving at a slow pace. Implementation is also related to the quality of the reporting by countries, underpinned by dedicated monitoring systems and strongly dependent on national priorities and funding. In the absence of a compliance instrument under the BSC, national reporting is at the behest of each coastal party leading to a 'piecemeal' assessment at regional level.

The 2009 BS SAP contains short, medium and long term targets as well Ecosystem Quality Objectives (EcoQOs) necessary to solve the main problems identified in the 2007 BS TDA. Furthermore it is grounded on a modern ecosystem approach in line with the requirements of the MSFD. It proposes indicators to assess progress and identifies a realistic time frame for achieving various objectives against key challenges. In spite of all these positive developments, the implementation is lagging behind. Some efforts are made by coastal countries such as Romania and Bulgaria, but are primarily driven by compliance to EU legislation (MSFD, WFD, etc.) rather than by the provisions of the SAP.

The management of the fish stocks in the Black Sea requires both strengthening of the regulatory and legal framework as well as regional harmonisation. The six coastal states have been unable to conclude a joint fisheries agreement. Moreover, no assessment of the fish stock for the entire basin has taken place.

What are the main challenges ahead?

Improved governance and speeding-up the implementation of existing commitments remain two key challenges for the Black Sea region. The BSC and its secretariat have been in operation for 20 years. Improvements are still needed for a better linkage between policies and the underpinning knowledge base in order to stimulate implementation. Strengthening the BSC secretariat and equipping it with additional human and financial resources remains a priority. Cooperation and regular information exchange between the Danube River Convention[21] and the BSC needs to be reinforced [22].

Concerning membership to the BSC, it is essential to continue strong EU engagement including eventual EU accession to the convention, which will help reap important benefits for the environment in the same way that EU participation has done in the Baltic and Mediterranean Conventions. This membership would strongly help facilitate strengthened cross-fertilisation between regional and EU relevant policy frameworks and accelerate the implementation of agreed targets with support from various programmes and instruments [23]. Considering the current political context in the region, the BSC and its secretariat have a crucial role to stimulate closer cooperation and dialogue between all coastal countries and participating networks and to monitor the implementation of the agreed commitments.

In parallel, full implementation of the MSFD and WFD by Romania and Bulgaria, followed gradually by Turkey, will, among other policies, have a direct impact in regulating land based pollution and contribute to achieving the objective of 'good water status' for the Black Sea. Nonetheless, the challenge remains in encouraging Ukraine, Russia and Georgia to meet this objective. Available EU instruments and initiatives, as for example the Black Sea Synergy, could be better focused to target these policies and support gradual harmonisation. The signature of enhanced EU association agreements with Georgia, Ukraine and Moldova in 2014, may well represent the ideal opportunity to accelerate this process.

The adoption of a dedicated fishery convention or protocol under the Black Sea Convention, under negotiation over the past 20 years [24], will hopefully create a coherent and sustainable framework for the management and conservation of the shared fish stock, grounded on common evaluation and assessment of the available resources. To reduce the risk of introducing/or reintroducing alien species in the Black Sea ecosystem, the ratification and implementation of the International Maritime Organization Convention on ballast water management by all coastal states remains essential. This need to be combined with an improved implementation of existing regulations in the field at individual country level.

Countries and regions

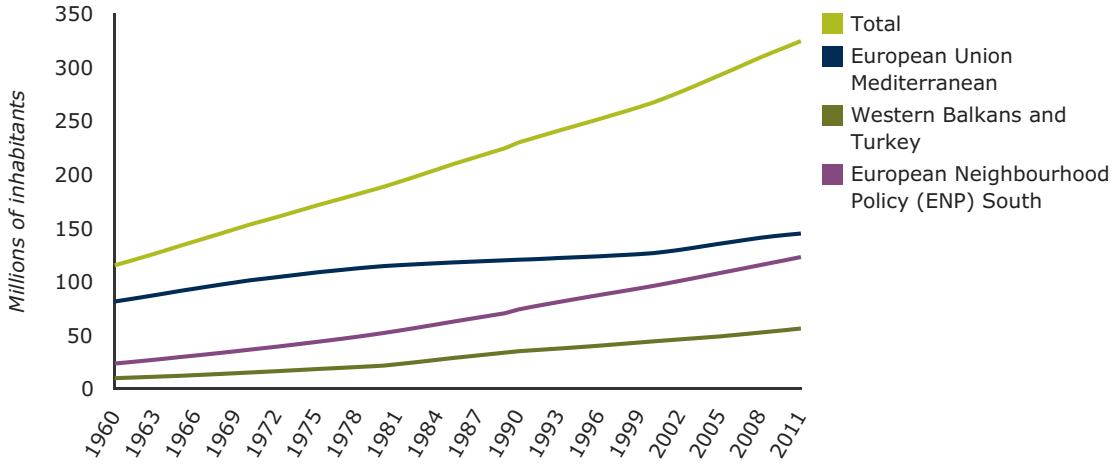
Mediterranean Sea region

Brief introduction

The Mediterranean Sea region — the largest of the semi-enclosed European seas — is surrounded by 22 countries, which together share a coastline of 46 000 km. It is also home to around 480 million people living across three continents: Africa, Asia and Europe. It is still one of the world's busiest shipping routes with about one-third of the world's total merchant shipping crossing the sea each year.[1]

Approximately one-third of the Mediterranean population is concentrated along its coastal regions. Meanwhile, about 250 million people (or 55% of the total population) resides in coastal hydrological basins. In the southern region of the Mediterranean,[2] 65% of the population (around 120 million inhabitants) is concentrated in coastal hydrological basins, where environmental pressures have increased.

Figure 1: Urban population growth of the Mediterranean countries



Note:
- Total Mediterranean Region: EU Mediterranean, Western Balkans and Turkey, European Neighbourhood Policy (ENP) South
- European Union Mediterranean Group: Cyprus, Spain, France, Greece, Croatia, Italy, Monaco, Malta, Slovenia
- Western Balkans and Turkey Group: Albania, Bosnia and Herzegovina, Montenegro, Turkey
- European Neighbourhood Policy (ENP) South Group: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria, Tunisia

Data sources: Plan Bleu. Mediterranean strategy for sustainable development follow-up

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The need for cooperation and coordination amongst all the countries bordering the Mediterranean has long been recognised. This has resulted in almost 40 years of international efforts to protect this fragile and vulnerable ecosystem: the Mediterranean Action Plan (MAP);[3] the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols;[4] and the Euro-Mediterranean Partnership (EUROMED).[5] EUROMED is also referred to as the Barcelona Process and was re-launched in 2008 as the Union for the Mediterranean (UfM).[6] In 2005, the Euro-Mediterranean partners committed themselves to substantially reduce pollution in the Mediterranean region by 2020. This became known as the 'Horizon 2020 Initiative' (H2020)[7] endorsed

in Cairo in 2006. It is now one of the key initiatives endorsed by UfM at its launch in Paris in 2008. [8]

H2020 builds on the work carried out by national and regional institutions. It operates within the framework of new and existing environmental policy instruments, and it supports the implementation of pollution-reduction commitments undertaken in the framework of the MAP and its Barcelona Convention. A number of concrete actions, as well as a timetable[9] on how to depollute the Mediterranean by 2020, were suggested during the 2006 ministerial conference. The corresponding roadmap[10] for the first phase of implementation (the period from 2007 to 2013) led to concrete developments within each of its different components (pollution reduction investments, capacity building, review monitoring and research).[11]

The mid-term review[12] of the H2020 initiative and the declaration of the Union for the Mediterranean (UfM) ministerial meeting on Environment and Climate change on 13 May 2014 in Athens[13] confirmed significant progress in investments in critical infrastructures, in building human capital, and in mainstreaming environment into other policies. The review stressed the strategic focus provided by the UNEP/MAP hotspots list and National Action Plans (NAPs).This marked an important milestone for regional environmental cooperation and commitment.

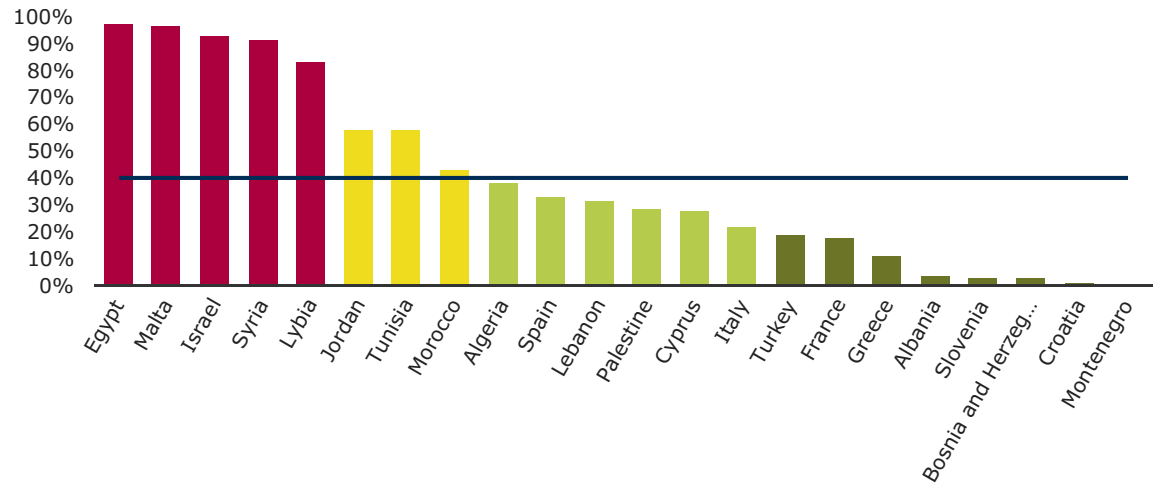
What are the main problems/threats related to the Mediterranean Sea region?

The Mediterranean Sea region has been identified as one of the main climate change hotspots (i.e. one of the areas most responsive to climate change) due to water scarcity, concentration of economic activities in coastal areas, and reliance on climate-sensitive agriculture.[14] However, the region itself emits low levels of greenhouse gases (GHGs) as compared to other areas in the world. Carbon dioxide (CO_2) emissions data show that in 2009, the Mediterranean countries together emitted 6.7% of the world's emissions, equivalent to more than 2 billion tonnes of CO_2. However, this amount has increased by a factor of 4 in the last 50 years, with an increase in the contribution from countries from the southern region of the Mediterranean from 9% to 30%. Meanwhile, the contribution from all European Union (EU) Mediterranean countries has decreased over the same period from 88% to 54%.[15]

Since 1970, an increase in air temperature of almost 2 °C has been recorded in south-western Europe (the Iberian peninsula and the south of France). The same increase has also been noted in northern Africa, although the paucity of data makes it more difficult to estimate. The range of the diurnal cycle[16] is shrinking. As for rainfall, precipitation has increased in the northern Alps, yet decreased in southern Europe, where a 20% drop in rainfall has been recorded. The Water Exploitation Index (WEI) (defined as the mean annual total demand for fresh water, divided by the long-term average freshwater resources) shows that southern countries are amongst the most water-stressed Mediterranean countries, with many having a WEI higher than 40%. Four southern Mediterranean countries (Egypt, Israel, Syria and Libya), together with Malta, have WEIs exceeding 80%. According to existing projections, the Mediterranean population classified as 'water-poor', (i.e. below 1 000 m^3 per resident per year) is forecast to increase from 180 million people today to over 250 million within 20 years.[17]

Sea-level rise is also of concern, with some parts of the region showing increases of more than 6 mm per year, and others showing decreases of more than 4 mm per year. The global mean of sea-level rise was around 3 mm per year over the last two decades. The Intergovernmental Panel on Climate change (IPCC) predicts a sea-level rise of 0.1–0.3 m by 2050 and of 0.1–0.9 m by 2100, with significant (and possibly higher) impacts on the southern Mediterranean region.[18]

Figure 2: Water Exploitation Index for renewable freshwater resources in Mediterranean countries (2005–2010)



Note: Blue line represents the "water stress threshold"

Data sources: Plan Bleu. Mediterranean strategy for sustainable development follow-up

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The Mediterranean region is characterised by a unique, rich, yet fragile biodiversity, hosted by many diverse ecosystems across the region,which together form an invaluable natural capital on which populations and economies depend. It is estimated that between 10 000 and 12 000 marine species thrive in the Mediterranean Sea. Around 20–30% of these species are endemic. Many of these species are threatened by a range of human activities. Pollution from land-based sources, such as discharges of excess nutrients and hazardous substances, marine litter, over-fishing, and degradation of critical habitats, are responsible for this biodiversity loss. The introduction of invasive alien species presents a threat to the biodiversity, structure, functioning, and stability of the invaded ecosystem. The number of invasive alien species has increased significantly since 1970, and currently stands at around 1 000.[19]

The recent EEA report on the Mediterranean[20] provided a number of key findings related to pollution of the sea. Over the last decade, sanitation has improved. Between 2003 and 2011, the proportion of the Mediterranean region population with access to sanitation increased from 87.5% to 92%. There are still 17.6 million people in the region without sanitation, a third of them living in urban areas.

Progress in urban wastewater management is difficult to assess as the data available do not provide sound evidence on regional trends. However, there is great potential to reuse wastewater in the region as currently only around 1% of wastewater is reused.

Solid waste generated in the region is approximately half that of the EU. Waste generation in the southern Mediterranean region has grown approximately 15% over the last decade, mostly due to a growing population and increased consumption. Waste management needs significant improvement. Around three-quarters of waste is collected, but most of this is still disposed in open dumps, which can have health impacts and lead to environmental problems. Although the EU is targeting a 70% recycling rate of household waste by 2030, less than 10% of the waste collected in the Mediterranean region is currently recycled.

Industrial emissions have a heavy impact on the Mediterranean. While pollution from heavy metals in seawater has decreased in recent years, local marine pollution from cities, industry and tourist resorts is still leading to widespread pollution of seas and beaches.

What are the main policy responses to key challenges?

Considering the systemic nature of the issues faced by the Mediterranean region, the Parties to the Barcelona Convention adopted an Ecosystem Approach[21] as an overarching principle of its policies and actions. This was with the view to achieve good environmental status according to an ambitious roadmap and cycle-based timetable, the first of which extends until 2019–2020. This focuses on a renewed emphasis on implementation and integration that will strengthen the ability to understand and address cumulative risks and effects, and will also better focus actions on priority targets. The Ecosystem Approach brings many sectoral analyses and management measures into a single integrated framework, which will result in an adaptive management strategy that will be periodically monitored, evaluated and revised. The implementation of the Ecosystem Approach process is developed in line with the EU Marine Strategy Framework Directive[22]. Moreover, other EU policies, such as the Water Framework Directive[23], the Habitats[24] and Birds[25] Directives, the Urban Waste Water Treatment Directive[26], and the Bathing Water Directive[27], also take an ecosystems approach. They aim to ensure the integration of environmental concerns into the different policies, agreements and legislative measures that have an impact on the marine environment.

What are the main challenges ahead?

The Mediterranean region is undergoing intensive demographic, social, cultural, economic and environmental changes. As Mediterranean countries are already facing important issues of water stress and extreme climate events (such as floods and droughts) climate change will most probably exacerbate issues, resulting in significant human and economic losses. According to the IPCC, a temperature rise of 2–3 °C is expected in the Mediterranean region by 2050, and a rise of 3–5 °C is expected by 2100.[18] Coordinated adaptation strategies and measures, across societies and economic sectors, will be key to respond to the changes.[28]

Population growth, combined with the growth of coastal urban hubs, generates multiple environmental pressures. These stem from increased demand for water and energy resources, generation of air and water pollution in relation to wastewater discharge or sewage overflows, waste generation, land consumption, and degradation of habitats, landscapes, and coastlines. These pressures are further amplified by the development of tourism, often concentrated in Mediterranean coastal areas, and rapidly evolving changes in consumption patterns as a result of increasing development. Since 1995, tourism has grown by almost 75% and projections show that the number of arrivals could reach around 640 million by 2025.[20]

Conversely, many infrastructures designed today for dealing with environmental and pollution problems will not be fully relevant to the needs of 2025. The UfM Secretariat has estimated a 'Depollution Gap'[29] based on the difference between the pollution that will be produced in 2025 and the pollution and flows that will be treated by the facilities that are already in place or are planned with secured funding. Existing depollution targets can only be achieved if the current 'end-of-pipe' solutions are complemented by other policies dedicated to pollution reduction and control at source or recycling. Maintenance and operational costs will rise significantly following recent investments, and countries will have to put in place adequate economic instruments to deal with operating costs separately from investment costs. In addition to the existing tariffs to be paid for the delivery of pollution abatement services, pollution charges are also needed.[29]

European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

+45 33 36 71 00
www.eea.europa.eu

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