



THE EUROPEAN ENVIRONMENT STATE AND OUTLOOK 2015

6. UNDERSTANDING THE SYSTEMIC CHALLENGES FACING
EUROPE



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6. Understanding the systemic challenges facing Europe



6.1 Progress towards 2020 targets is mixed, and the 2050 visions and goals will require new efforts

The EEA's 2010 report *The European environment — state and outlook (SOER 2010)* drew attention to the urgent need for Europe to shift towards a much more integrated approach to addressing persistent, systemic environmental and health challenges. It identified the transition towards a green economy as one of the changes needed to secure the long-term sustainability of Europe (EEA, 2010d). Overall, the analysis presented so far in this report, summarised in Table 6.1, provides limited evidence of progress towards this goal.

As illustrated in Table 6.1, Europe's **natural capital** is not yet being protected, conserved and enhanced at the level required to achieve the ambitions of the 7th Environment Action Programme. For example, a high proportion of protected species (60%) and habitat types (77%) are considered to be in unfavourable conservation status, and Europe is not on track to meet its overall target of halting biodiversity loss by 2020, even though some more specific targets are being met.

Although reduced pollution has significantly improved the quality of Europe's air and water, loss of soil functions, land degradation and climate change remain major concerns. Looking ahead, climate change impacts are projected to intensify, and the underlying drivers of biodiversity loss are expected to persist.

Turning to **resource-efficiency and the low-carbon economy**, the short-term trends are more encouraging. European greenhouse gas emissions have decreased by 19% since 1990 despite a 45% increase in economic output. Fossil fuel use has declined, as have emissions of some pollutants from transport and industry. More recently, the EU's total resource use has declined by 18% since 2007, less waste is being generated and recycling rates have improved in nearly every country.

However, these trends should be interpreted in the wider socio-economic context. While policies are working, the 2008

financial crisis and subsequent economic recessions certainly contributed to the reduction of some pressures, and it remains to be seen whether all improvements will be sustained. In addition, many pressures remain considerable despite recent advances. Fossil fuels still account for three quarters of the EU energy supply, and European economic systems remain intensive in their use of material resources and water. Looking ahead, projected reductions of greenhouse gas emissions are insufficient to bring the EU on a pathway towards its 2050 decarbonisation target.

Regarding **environmental risks to health**, there have been marked improvements in the quality of drinking water and bathing water in recent decades and some hazardous pollutants have been reduced. However, air pollution and noise cause serious health impacts, particularly in urban areas. In 2011, about 430 000 premature deaths in the EU-28 were attributed to fine particulate matter (PM_{2.5}). Exposure to environmental noise has been estimated to contribute to at least 10 000 cases of premature deaths due to coronary heart disease and stroke each year.

Rates of endocrine diseases and disorders have also increased in line with more widespread use of chemicals. Looking ahead, the outlook for environmental health risks in coming decades is uncertain. Projected improvements in air quality are not expected to be sufficient to prevent continued harm to health and the environment. Moreover, health impacts resulting from climate change are likely to get worse.

When the trends presented in Table 6.1 are viewed collectively, several patterns emerge. First, policies have had a clearer impact in terms of improving resource efficiency than in ensuring ecosystem resilience. Reductions in environmental pressures associated with enhanced resource efficiency have not yet translated into a sufficient reduction of environmental impacts or improved ecosystem resilience. For example, although water pollution is declining, most freshwater bodies across Europe are not expected to achieve good ecological status by 2015. Second, in several instances the long-term outlook is less positive than recent trends might imply.

Table 6.1 An indicative summary of environmental trends

| | 5-10 year trends | 20+ years outlook | Progress to policy targets | Read more in Section ... |
|---|------------------|-------------------|----------------------------|--------------------------|
| Protecting, conserving and enhancing natural capital | | | | |
| Terrestrial and freshwater biodiversity | | | □ | 3.3 |
| Land use and soil functions | | | No target | 3.4 |
| Ecological status of freshwater bodies | | | ☒ | 3.5 |
| Water quality and nutrient loading | | | □ | 3.6 |
| Air pollution and its ecosystem impacts | | | □ | 3.7 |
| Marine and coastal biodiversity | | | ☒ | 3.8 |
| Climate change impacts on ecosystems | | | No target | 3.9 |
| Resource efficiency and the low-carbon economy | | | | |
| Material resource efficiency and material use | | | No target | 4.3 |
| Waste management | | | □ | 4.4 |
| Greenhouse gas emissions and climate change mitigation | | | ☑/☒ | 4.5 |
| Energy consumption and fossil fuel use | | | ☑ | 4.6 |
| Transport demand and related environmental impacts | | | □ | 4.7 |
| Industrial pollution to air, soil and water | | | □ | 4.8 |
| Water use and water quantity stress | | | ☒ | 4.9 |
| Safeguarding from environmental risks to health | | | | |
| Water pollution and related environmental health risks | | | ☑/□ | 5.4 |
| Air pollution and related environmental health risks | | | □ | 5.5 |
| Noise pollution (especially in urban areas) | | N.A. | □ | 5.6 |
| Urban systems and grey infrastructure | | | No target | 5.7 |
| Climate change and related environmental health risks | | | No target | 5.8 |
| Chemicals and related environmental health risks | | | □/☒ | 5.9 |

| Indicative assessment of trends and outlook | | Indicative assessment of progress to policy targets | |
|---|-------------------------------|---|--|
| | Deteriorating trends dominate | ☒ | Largely not on track to achieving key policy targets |
| | Trends show mixed picture | □ | Partially on track to achieving key policy targets |
| | Improving trends dominate | ☑ | Largely on track to achieving key policy targets |

Note: The indicative assessments presented here are based on key indicators (as available and used in SOER thematic briefings), as well as expert judgement. The corresponding 'Trends and outlook' boxes in the respective sections provide additional explanations.

These discrepancies can be explained by several factors, for example:

- pressures such as resource use and emissions remain substantial despite recent reductions;
- the complexity of environmental systems can cause a considerable time lag between reduced pressures and changes in environmental impacts and status;
- the impacts of external pressures (related to global megatrends and sectors such as transport, agriculture and energy) can counteract the effects of specific policy measures and local management efforts;
- technology-driven efficiency gains may be undermined by lifestyle changes or increased consumption, partly because efficiency improvements can make a product or service cheaper;
- changing exposure patterns and increased human vulnerabilities (for example linked to urbanisation, population ageing and climate change) can offset the benefits of reductions in overall pressures.

In summary, the systemic and transboundary nature of many long-term environmental challenges are significant obstacles to achieving the EU's 2050 vision of living well within the limits of the planet. Europe's success in responding to these challenges will depend greatly on how effectively it implements existing environmental policies and takes necessary additional steps to formulate integrated approaches to today's environmental and health challenges.

6.2 Meeting long-term visions and objectives requires reflection on prevailing knowledge and policy frameworks

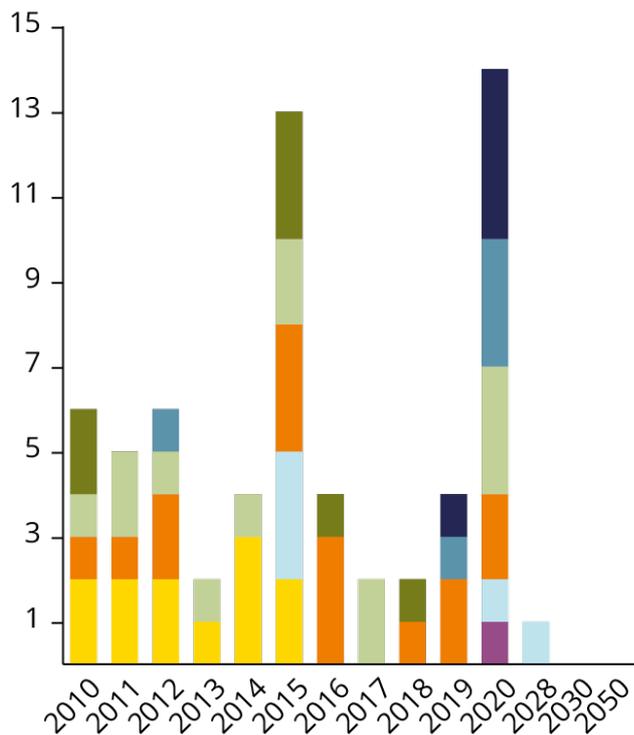
Managing these systemic environmental and health challenges requires reflection on existing policy frameworks along three lines: knowledge gaps, policy gaps and implementation gaps (Box 2.2).

The preceding chapters have identified a range of knowledge gaps regarding the relationships between ecosystem resilience, resource efficiency and human well-being. Some of these gaps are caused by an inadequate understanding of environmental processes and thresholds at both the European and global level and the consequences of exceeding these thresholds. Other gaps are as a result of a lack of knowledge in specific areas such as biodiversity, ecosystems and their services; the advantages and disadvantages of new technologies; and the complex interactions between environmental change, human health and well-being.

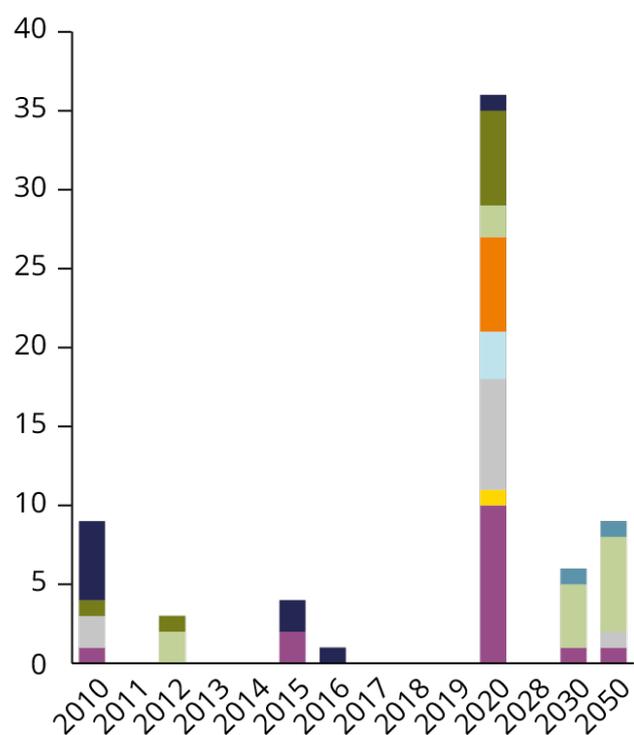
When it comes to policy gaps, the most important problems are the timeframes that current policy frameworks address (too few long-term binding targets); and their degree of integration. On the issue of timeframes, the EU in 2013 had an extensive set of 63 binding and 68 non-binding targets, with the majority to be achieved by 2015 and 2020 (Figure 6.1). Since then, both the EU and European countries have continued to set new objectives and targets for the period 2025 to 2050, partly in response to an enhanced understanding of systemic risks. However, this only occurs in a small number of policy areas and few of these new objectives and targets are legally binding. Past experience with target setting highlights the value of setting short and medium-term targets and actions to enable progress towards longer-term objectives.

Figure 6.1 Binding targets (left) and non-binding objectives (right) in EU environmental policies, by sector and target-year

Number of binding targets



Number of non-binding objectives



- Energy
- GHG emissions and ozone depleting substances (ODS)
- Air pollution and air quality
- GHG emissions and air pollution in transport
- Waste
- Water
- Sustainable consumption and production (SCP) and resource efficiency
- Chemicals
- Biodiversity and land use

Source: EEA, 2013m.

On the issue of policy integration, the 7th Environment Action Programme aims to improve environmental integration and policy coherence. It emphasises that more effective integration of the environment in all relevant policy areas can reduce sectoral pressures on the environment and so help to meet environment and climate-related targets. Although some progress has been made on integration (e.g. climate and energy), policy measures still tend to be compartmentalised, especially in the domain of ecosystem-based management (e.g. agriculture and nature protection).

The implementation gap is the gap between the initial stated policy intentions and the results delivered. This gap exists for a range of reasons, including procedural time-lags, knowledge gaps, and difficulties working across different governance levels. Previous chapters and other studies indicate that full and even implementation of existing environmental policy would be a sound investment for the future of Europe's environment and people's health, as well as for the economy (EU, 2013).

However, there is often a decade or more between the adoption of EU environment and climate policies and their implementation in countries. The environmental policy domain has more open infringement proceedings than any

other EU policy sector. And the costs associated with failure to implement environment policies — including the costs of infringement cases — are high, and broadly estimated at EUR 50 billion a year (COWI et al., 2011). More implementation of what has already been agreed could deliver a wide array of socio-economic benefits often not captured by prevailing cost-benefit analyses.

Policy packages have been developed in recent years that aim to address these gaps. These have tended to be more successful in addressing knowledge and implementation gaps than policy gaps (in particular policy gaps related to integration) as they still tend to be focused on a single policy area. There is room for more coherent and adaptive policy approaches that can respond to changes, deliver multiple benefits, and manage difficult trade-offs.

6.3 Securing humanity's basic resource needs requires integrated, coherent management approaches

Recent analysis highlights the strong interdependence between the resource use systems that meet Europe's need for food, water, energy and materials. This interdependence can be seen in terms of these systems' underlying drivers, the environmental pressures they create, and their impacts. This underscores further the value of integrated approaches to action (EEA, 2013f).

For example, pesticides and excessive nutrients pollute surface water and groundwater bodies, necessitating costly measures to maintain drinking water quality. Irrigation for agriculture may add to water stress, and cultivation and drainage patterns affect regional flooding risks. Agricultural production affects greenhouse gas emissions, which in turn drive climate change.

Urbanisation also has implications for habitat fragmentation and biodiversity loss, as well as for vulnerability to climate change through enhanced flooding risks. Construction methods and settlement patterns have an immediate impact on the environment and considerable implications for energy and water use. With most environmental pressures from housing resulting from the use phase (heating, and transport to and from housing), there are clear links between housing and energy use.

Due to this interdependence, attempts to address these challenges can lead to unintended outcomes, with measures to alleviate pressures in one area often increasing pressures elsewhere. For example, a shift towards bioenergy cropping can reduce greenhouse gas emissions but can add pressures to land and water resources, potentially impacting biodiversity, ecosystem functions and landscape amenity values.

Managing numerous trade-offs and co-benefits necessitates an integrated response, yet current policy options to address these issues at European level are largely independent of each other. They would benefit from being implemented within a more integrated spatial and temporal perspective, bringing together ecosystem-based management and land-use planning. A primary focus for such combined intervention could be agricultural policy, because current subsidies and support structures are not necessarily underpinned by resource efficiency principles (Box 6.2).

Box 6.2 Sectoral policies and the green economy

The unprecedented global demands for resources such as food, fibre, energy, and water make it imperative to use our natural resources much more efficiently and maintain the ecosystems from which natural resources are sourced.

There are major differences of approach in the key EU policies that aim at greater resource efficiency and sustainability. For example, although the ambitions for a low-carbon society have been translated into quantitative 2050 targets for the energy and transport sectors (see Chapter 4), the long-term perspective for agriculture and fisheries remains largely unclear.

Although food security is an underlying concern in both the Common Agricultural Policy and the Common Fisheries Policy, a coherent and common framework is still lacking. This is in spite of the fact that both agriculture and fisheries create similar pressures on the environment. For example, nutrient surpluses in intensive agriculture and aquaculture affect the water quality of coastal zones. Treating the environmental impacts of these two sectors in an integrated way would therefore merit consideration. This is increasingly recognised in overarching policy frameworks such as the 7th Environment Action Programme, the 2020 Biodiversity Strategy, and the Integrated Maritime Policy.

The recent reform of the Common Agricultural Policy has introduced new 'greening measures', and has tied subsidies to stricter cross-compliance with environment legislation. However, a more ambitious and long-term approach would be needed to address the resource efficiency of the agricultural sector in terms of productivity, land take, carbon capture, water use, and dependence on mineral fertilisers and pesticides.

As for the sustainability of fisheries, and despite the increasing attention to ecosystem-based management, the ecological status of fish stocks remains of major concern particularly in the Mediterranean and Black Seas. The Common Fisheries Policy aims to ensure that fishing and aquaculture are environmentally, economically and socially sustainable. But in practice, balancing short-term economic considerations and long-term environmental concerns remains challenging.

When it comes to food security, policy should also focus on food consumption, not just food production. For example, dietary changes, more effective distribution chains, and food waste prevention could potentially mitigate the environmental pressures of food provision, and — particularly in the case of agriculture — compensate for the yield penalties of more environmentally friendly production.

6.4 Globalised production-consumption systems pose major policy challenges

The increasing sophistication and scale of the production and consumption systems that meet European demand for goods and services create major challenges for policymaking and businesses, as well as opportunities for innovation. Driven by a combination of economic incentives, consumer preferences, environmental standards, technological innovation, development of transport infrastructure, and liberalisation of trade, production-consumption systems for many goods and services span the globe, engaging numerous actors (EEA, 2014f).

The globalisation of supply chains can reduce consumer awareness of the social, economic, and environmental implications of their purchasing decisions. This means that consumer choices may produce environmentally and socially undesirable outcomes, especially since market prices for end products typically do not reflect the full costs and benefits arising along the value chain.

Recent analysis of the production-consumption systems that meet European demand for food, electrical and electronic

goods and clothing illustrates the complex mixture of environmental and socio-economic costs and benefits that can occur along supply chains (EEA, 2014f). These systems are particularly globalised and the EU is heavily reliant on imports of these goods. Increasing international trade has provided some benefits to European consumers. However, it also hampers identification and effective management of environmental and social problems related to European consumption.

Production-consumption systems can serve multiple and sometimes contradictory functions (see Section 4.11). This means that alterations to these systems will inevitably involve trade-offs. As a result, different groups are likely to have contrasting incentives for either facilitating or resisting change; and potential losers in change situations are often more vocal than winners (EEA, 2013k).

Adopting an integrated perspective can result in fuller understanding of production-consumption systems: the incentives that structure them, the functions they perform, the ways system elements interact, the impacts they generate, and the opportunities to reconfigure them (EEA, 2014f). Integrated approaches such as life-cycle thinking also help ensure that improvements in one area (such as more efficient production) are not offset by changes in other areas (such as increased consumption) (see Section 4.11).

Government efforts to manage the socio-economic and environmental impacts of production-consumption systems can face many obstacles. In addition to the difficulty that European policymakers face in dealing with trade-offs and in monitoring the impacts associated with highly sophisticated supply chains, they have relatively little scope to influence these impacts in other world regions.

The European policy framework is mostly targeted on impacts that occur within Europe and on the production and end-of-life stages of systems and products. Policies addressing the environmental impacts of products and their consumption are in their early stages, with the notable exception of those that deal with the energy efficiency of electrical and electronic goods. The use of information-based instruments such as eco-labels dominates, in part because international trade law limits the use of regulations and market instruments to influence production methods for imports. An overarching challenge is to find ways to reconfigure production-consumption systems and retain or increase their benefits, whilst reducing their social and environmental harms.

6.5 The wider EU policy framework provides a good basis for an integrated response, but action needs to match words

In response to the financial crisis many European countries adopted recovery policies in 2008 and 2009 with a green economy focus. Although the focus of policymakers has subsequently shifted to fiscal consolidation and sovereign debt crises, the latest survey of European citizen attitudes towards the environment shows that concern about environmental issues has not diminished. European citizens strongly believe that more needs to be done at all levels to protect the environment, and that national progress should be measured by environmental, social, and economic criteria (EC, 2014b).

The green economy is seen by the EU, UN and the OECD as a strategic approach to the systemic challenges of global environmental degradation, natural resource security, employment, and competitiveness. Policy initiatives in support of green economy objectives can be found across major EU strategies, including the Europe 2020 Strategy, the 7th Environment Action Programme, the EU Framework Programme for Research and Innovation (Horizon 2020) and sectoral policies, such as transport and energy.

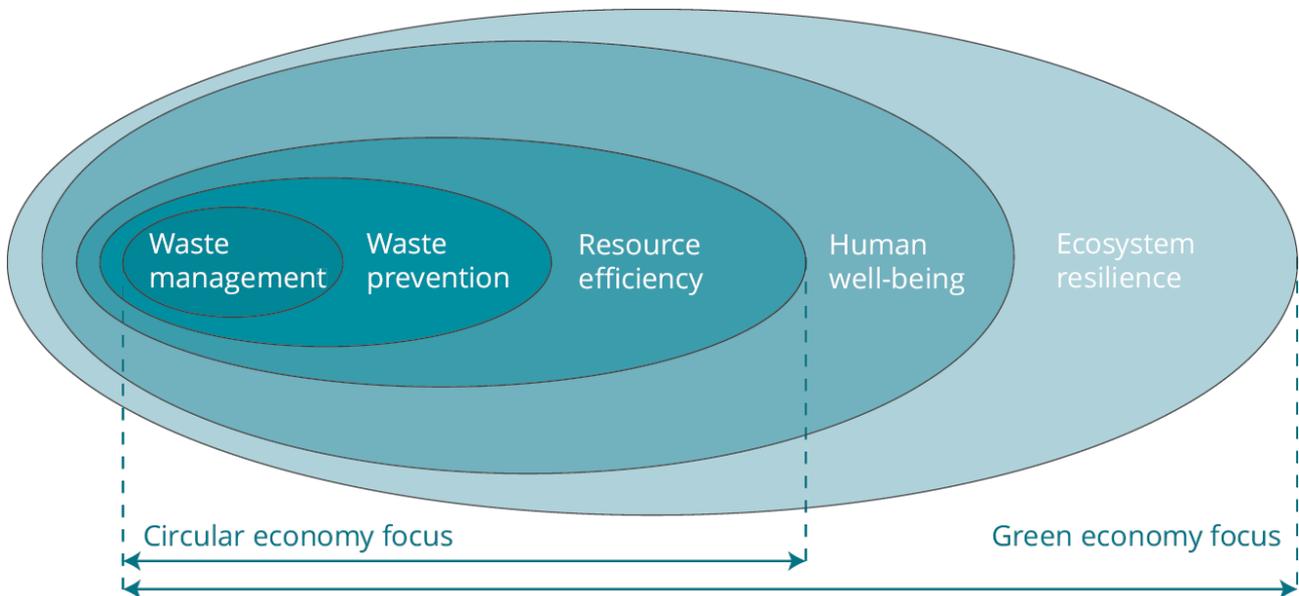
The green economy approach emphasises economic development that is resource efficient, within environmental limits and equitable across society. It requires economic, environmental and social goals to be pursued simultaneously. Prevailing policy practice remains mostly compartmentalised and shaped by established governance structures, so the opportunities that a green economy perspective offers in terms of addressing systemic challenges and harnessing synergies are still to be fully realised.

The wider perspective of the green economy provides a framework for the integration of current policies. For example, Figure 6.2 illustrates how European policy priorities relating to material resource use can be represented as a nested and integrated set of objectives. A circular economy focuses on optimising material resource flows by cutting waste to as close to zero as possible. This encompasses waste management and waste prevention within a resource efficiency context.

The green economy approach goes further than the circular economy, extending the focus beyond waste and material resources to how the use of water, energy, land and biodiversity should be managed in accordance with objectives for ecosystem resilience and human well-being. The green economy also addresses wider economic and social aspects, such as competitiveness and social inequalities regarding exposure to environmental pressures and access to green spaces.

Like previous reports on The European environment — state and outlook (SOER), this report demonstrates that environmental policy has delivered substantial improvements but that major environmental challenges remain. It provides a more detailed understanding of the challenges that Europe faces in achieving a transition to a green economy. In doing so it helps identify opportunities to respond to these challenges.

Figure 6.2 The green economy as an integrating framework for policies relating to material use



Source: EEA.

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