

The European environment — state and outlook 2020

Knowledge for transition to a sustainable Europe



European Environment Agency



II.

Executive summary

SOER 2020 in a nutshell

In 2020, Europe faces environmental challenges of unprecedented scale and urgency. Although EU environment and climate policies have delivered substantial benefits over recent decades, Europe faces persistent problems in areas such as biodiversity loss, resource use, climate change impacts and environmental risks to health and well-being. Global megatrends such as demographic change are intensifying many environmental challenges, while rapid technological change brings new risks and uncertainties.

Recognising these challenges, the EU has committed to a range of long-term sustainability goals with the overall aim of 'living well, within the limits of our planet'. Achieving these goals will not be possible without a rapid and fundamental shift in the character and ambition of Europe's responses. Europe needs to find ways to transform the key societal systems that drive environment and climate pressures and health impacts — rethinking not just technologies and production processes but also consumption patterns and ways of living. This will require immediate and concerted action, engaging diverse policy areas and actors across society in enabling systemic change.

Europe stands at a critical juncture in 2020. Its leaders have opportunities to shape future developments that will not be available to their successors. The coming decade will therefore be of decisive importance in determining Europe's opportunities in the 21st century.

These, in short, are the overarching conclusions of *The European environment — state and outlook 2020* (SOER 2020). The report provides a comprehensive assessment of Europe's environment to support governance and inform the public. Like all EEA reports, it is founded on the work of the European Environment Information and Observation Network (Eionet) — a partnership between the EEA and its 33 member countries and six cooperating countries.

Making sense of the European environment's state, trends and prospects requires an integrated approach that acknowledges the complex drivers and implications of environmental change. SOER 2020 provides just that, presenting the global context that shapes Europe's development (Part 1), European environmental and sectoral trends and outlooks (Part 2) and the factors constraining or enabling transformative change (Part 3). It concludes in Part 4 with reflections on how Europe can shift its trajectory and achieve a sustainable future.

Europe continues to consume more resources and contribute more to environmental degradation than other world regions.

SOER 2020 identifies many challenges and barriers. But it also sees reasons for hope. European citizens are increasingly voicing their frustration with the shortfalls in environment and climate governance. Knowledge about systemic challenges and responses is growing and is increasingly reflected in EU policy frameworks. In parallel, innovations have emerged rapidly in recent years, including new technologies, business models and community initiatives. Some cities and regions are leading the way in terms of ambition and creativity, experimenting with different ways of living and working and sharing ideas across networks.

All of these developments are important because they create space for governments to bring a new scale of ambition to policies, investments and actions. They also help raise awareness, encouraging citizens to rethink behaviours and lifestyles. Europe must seize these opportunities, using every means available to deliver transformative change in the coming decade.

Europe's environment in a changing global context

The environmental and sustainability challenges that Europe faces today are rooted in global developments stretching back over decades. During this period, the 'Great Acceleration' of social and economic activity has transformed humanity's relationship with the environment. Since 1950, the global population has tripled to 7.5 billion; the number of people living in cities has quadrupled to more than 4 billion; economic output has expanded 12-fold, matched by a similar increase in the use of nitrogen, phosphate and potassium fertilisers; and primary energy use has increased five-fold. Looking ahead, these global developments look set to continue increasing pressures on the environment. The world's population is projected

to grow by almost one third to 10 billion by 2050. Globally, resource use could double by 2060, with water demand increasing 55 % by 2050 and energy demand growing 30 % by 2040.

The great acceleration has undoubtedly delivered major benefits, alleviating suffering and enhancing prosperity in many parts of the world. For example, the share of the global population living in extreme poverty has decreased sharply — from 42 % in 1981 to less than 10 % in 2015. Yet the same developments have also caused widespread damage to ecosystems. Globally, about 75 % of the terrestrial environment and 40 % of the marine environment are now severely altered. The Earth is experiencing exceptionally rapid loss of biodiversity, and more species are threatened with extinction now than at any point in human history. Indeed, there is evidence that a sixth mass extinction of biodiversity is under way.

Many of the changes in the global climate system observed since the 1950s are similarly unprecedented over decades to millennia. They largely result from greenhouse gas emissions from human activities, such as burning fossil fuels, agriculture and deforestation.

Both directly and indirectly, these pressures are inflicting tremendous harm on human health and well-being. The global burden of disease and premature death related to environmental pollution is already three times greater than that from AIDS, tuberculosis and malaria combined. But the continuation of the great acceleration could create even more far-reaching threats if pressures trigger the collapse of ecosystems such as the Arctic, coral reefs and the Amazon forest. Sudden and irreversible shifts of this sort could severely disrupt nature's ability to deliver essential services such as supplying food and resources, maintaining clean water and fertile soils, and providing a buffer against natural disasters.

As a pioneer of industrialisation, Europe has played a pivotal role in shaping these global changes. Today, it continues to consume more resources and contribute more to environmental degradation than many other world regions. To meet these high consumption levels, Europe depends on resources extracted or used in other parts of the

world, such as water, land, biomass and other materials. As a result, many of the environmental impacts associated with European production and consumption occur outside Europe.

Collectively, these realities add up to a profound challenge for Europe and other world regions. The current trajectories of social and economic development are destroying the ecosystems that ultimately sustain humanity. Shifting onto sustainable pathways will require rapid and large-scale reductions in environmental pressures, going far beyond the current reductions.

Europe's environment in 2020

As the character and scale of global environmental and climate challenges has become clearer, policy frameworks have evolved. Europe's environmental policy framework — the environmental acquis — is increasingly shaped by ambitious long-term visions and targets. The overarching vision for Europe's environment and society is set out in the Seventh Environment Action Programme (7th EAP), which envisages that by 2050:

We live well, within the planet's ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society.

EU environmental policies are guided by three thematic policy priorities in the 7th EAP: (1) to protect, conserve and enhance the EU's natural capital; (2) to turn the EU into a resource-efficient, green and competitive low-carbon economy; and (3) to safeguard the EU's citizens from environment-related pressures and risks to their health and well-being. In recent years, the EU has also adopted a series of strategic framework policies that focus on transforming the EU economy and particular systems (e.g. energy, mobility) in ways that

deliver prosperity and fairness, while also protecting ecosystems. The United Nations (UN) Sustainable Development Goals complement these frameworks, providing a logic for transformative change that acknowledges the interdependence of social, economic and environmental targets.

Viewed against Europe's long-term vision and complementary policy targets, it is clear that Europe is not making enough progress in addressing environmental challenges. The messages from the SOER 2020 assessment of recent trends and outlooks is clear: policies have been more effective in reducing environmental pressures than in protecting biodiversity and ecosystems, and human health and well-being. Despite the successes of European environmental governance, persistent problems remain and the outlook for Europe's environment in the coming decades is discouraging (Table ES.1).

It is clear that natural capital is not yet being protected, conserved and enhanced in accordance with the ambitions of the 7th EAP. Small proportions of protected species (23 %) and habitats (16 %) assessed are in favourable conservation status and Europe is not on track to meet its overall target of halting biodiversity loss by 2020. Europe has achieved its targets for designating terrestrial and marine protected areas and some species have recovered, but most other targets are likely to be missed.

Policy measures targeted at natural capital have delivered benefits in some areas, but many problems persist and some are getting worse. For example, reduced pollution has improved water quality, but the EU is far from achieving good ecological status for all water bodies by 2020. Land management has improved, but landscape fragmentation continues to increase, damaging habitats and biodiversity. Air pollution continues to impact biodiversity and ecosystems, and 62 % of Europe's ecosystem area is exposed to excessive nitrogen levels, causing

SOER 2020 shows that despite the success of EU environmental policies, the outlook for Europe's environment is discouraging.

TABLE ES.1 Summary of past trends, outlooks and prospects of meeting policy objectives/targets

Theme	Past trends and outlook		Prospects of meeting policy objectives/targets		
	Past trends (10-15 years)	Outlook to 2030	2020	2030	2050
Protecting, conserving and enhancing natural capital					
Terrestrial protected areas					
Marine protected areas					
EU protected species and habitats					
Common species (birds and butterflies)					
Ecosystem condition and services					
Water ecosystems and wetlands					
Hydromorphological pressures					
State of marine ecosystems and biodiversity					
Pressures and impacts on marine ecosystems					
Urbanisation and land use by agriculture and forestry					
Soil condition					
Air pollution and impacts on ecosystems					
Chemical pollution and impacts on ecosystems					
Climate change and impacts on ecosystems					
Resource-efficient, circular and low-carbon economy					
Material resource efficiency					
Circular use of materials					
Waste generation					
Waste management					
Greenhouse gas emissions and mitigation efforts					
Energy efficiency					
Renewable energy sources					
Emissions of air pollutants					
Pollutant emissions from industry					
Clean industrial technologies and processes					
Emissions of chemicals					
Water abstraction and its pressures on surface and groundwater					
Sustainable use of the seas					
Safeguarding from environmental risks to health and well-being					
Concentrations of air pollutants					
Air pollution impacts on human health and well-being					
Population exposure to environmental noise and impacts on human health					
Preservation of quiet areas					
Pollution pressures on water and links to human health					
Chemical pollution and risks to human health and well-being					
Climate change risks to society					
Climate change adaptation strategies and plans					
Indicative assessment of past trends (10-15 years) and outlook to 2030		Indicative assessment of prospects of meeting selected policy objectives/targets			
	Improving trends/developments dominate	Year		Largely on track	
	Trends/developments show a mixed picture	Year		Partially on track	
	Deteriorating trends/developments dominate	Year		Largely not on track	

Note: The year for the objectives/targets does not indicate the exact target year but the time frame of the objectives/targets.

EU policies have been more effective in reducing environmental pressures than in protecting natural capital and human health.

eutrophication. The impacts of climate change on biodiversity and ecosystems are expected to intensify, while activities such as agriculture, fisheries, transport, industry and energy production continue to cause biodiversity loss, resource extraction and harmful emissions.

Europe has made more progress in relation to resource efficiency and the circular economy. Material consumption has declined and resource efficiency improved as gross domestic product has increased. Greenhouse gas emissions declined by 22 % between 1990 and 2017, due to both policy measures and economic factors. The share of renewable energy sources in final energy consumption increased steadily to 17.5 % in 2017. Energy efficiency has improved, and final energy consumption has declined to roughly the level in 1990. Emissions of pollutants to both air and water have been reduced, while total EU water abstraction decreased by 19 % between 1990 and 2015.

More recent trends are less positive, however. For example, final energy demand has actually increased since 2014 and, if that continues, the EU's 2020 target for energy efficiency may not be met. Harmful emissions from transport and agriculture have also risen, and production and consumption of hazardous chemicals have remained stable. The outlook to 2030 suggests that the current rate of progress will not be sufficient to meet 2030 and 2050 climate and energy targets. In addition, addressing environmental pressures from economic sectors through environmental integration has not been successful, as illustrated by agriculture's continued impacts on biodiversity and pollution of air, water and soil.

Europe has achieved some success in protecting Europeans from environmental risks to health and well-being. For example, drinking and bathing water are generally of high quality throughout Europe.

But, again, there are persistent problems in some areas and the outlook is worrying. For example, some persistent and mobile chemicals resist even advanced drinking water treatment. Similarly, although emissions of air pollutants have declined, almost 20 % of the EU's urban population lives in areas with concentrations of air pollutants above at least one EU air quality standard. Exposure to fine particulate matter is responsible for around 400 000 premature deaths in Europe every year, and central and eastern European countries are disproportionately affected.

Human health and well-being are still affected by noise, hazardous chemicals and climate change. Accelerating climate change is likely to bring increased risks, particularly for vulnerable groups. Impacts can arise from heat waves, forest fires, flooding and changing patterns in the prevalence of infectious diseases. In addition, environmental risks to health do not affect everyone in the same way, and there are pronounced local and regional differences across Europe in terms of social vulnerability and exposure to environmental health hazards. In general, the outlook for reducing environmental risks to health and well-being is uncertain. Systemic risks to health are complex and there are important gaps and uncertainties in the knowledge base.

Understanding and responding to systemic challenges

The persistence of major environmental challenges can be explained by a variety of related factors. First, environmental pressures remain substantial despite progress in reducing them. The pace of progress has also slowed in some important areas, such as greenhouse gas emissions, industrial emissions, waste generation, energy efficiency and the share of renewable energy. This implies a need to go beyond incremental efficiency improvements and to strengthen the implementation of environmental policies to achieve their full benefits.

The complexity of environmental systems can also mean that there is a considerable time lag between reducing pressures and seeing improvements in natural capital, and human health and well-being. Environmental outcomes, such as biodiversity loss,

Societal systems of production and consumption (food, energy and mobility) must be transformed to achieve Europe's sustainable, low-carbon future.

are often determined by diverse factors, meaning that the effectiveness of policy measures and local management efforts can be offset by external factors. These include global developments such as growing populations, economic output and resource use, all of which influence the situation in Europe. Looking ahead, concerns are also emerging about drivers of change, such as technological and geopolitical developments that have unclear implications.

Perhaps the most important factor underlying Europe's persistent environmental and sustainability challenges is that they are inextricably linked to economic activities and lifestyles, in particular the societal systems that provide Europeans with necessities such as food, energy and mobility. As a result, society's resource use and pollution are tied in complex ways to jobs and earnings across the value chain; to major investments in infrastructure, machinery, skills and knowledge; to behaviours and ways of living; and to public policies and institutions.

The many interlinkages within and between societal systems mean that there are often major barriers to achieving the rapid and far-reaching change that is needed to achieve Europe's long-term sustainability objectives. For example:

- Production-consumption systems are characterised by lock-ins and path dependency, linked to the fact that system elements — technologies, infrastructures, knowledge and so on — have often developed together over decades. This means that radically altering these systems is likely to disrupt investments, jobs, behaviours and values, provoking resistance from affected industries, regions or consumers.

- Interlinkages and feedbacks within systems mean that change often produces unintended outcomes or surprises. For example, technology-driven gains may be undermined by lifestyle changes, partly because of 'rebound effects' when efficiency improvements result in cost savings that enable increased consumption.

- Production-consumption systems are also linked directly and indirectly, for example through their reliance on a shared natural capital base to provide resources and absorb wastes and emissions. This 'resource nexus' means that addressing problems in one area can produce unintended harm elsewhere, for example deforestation and increases in food prices due to biofuel production.

The systemic character of Europe's environmental challenges helps explain the limitations of established environmental governance approaches in delivering needed change. Although signs of progress have been observed across the food, energy and mobility systems, environmental impacts remain high and current trends are not in accordance with long-term environmental and sustainability goals.

A growing body of research and practice provides insights into how fundamental systemic change can be achieved. Such transitions are long-term processes that depend critically on the emergence and spread of diverse forms of innovation that trigger alternative ways of thinking and living — new social practices, technologies, business models, nature-based solutions, and so on. It is impossible to know in advance precisely what innovations will emerge, whether or how they will be integrated into lifestyles, and how they will affect sustainability outcomes. Transitions therefore involve numerous uncertainties, conflicts and trade-offs.

This understanding of systemic change has important implications for governance. First, the perceived role of government shifts from acting as a 'pilot', with the knowledge and tools to steer society towards sustainability, to a role as an enabler of society-wide innovation and transformation. Top-down planning still has a role in some contexts.

But governments also need to find ways to leverage the powers of citizens, communities and businesses.

Achieving this requires contributions across policy areas and levels of government towards common goals. Environmental policy tools remain essential. But enabling systemic change will require a much broader policy mix to promote innovation and experimentation, to enable new ideas and approaches to spread, and to ensure that structural economic change produces beneficial and fair outcomes. The complexity and uncertainty of transition processes means that governments will also need to find ways to coordinate and steer actions across society towards long-term sustainability goals and to manage the risks and unintended consequences that inevitably accompany systemic change.

Where does Europe go from here?

Taken together, the analysis in Parts 1-3 highlights the persistence, scale and urgency of the challenges facing Europe. Achieving the EU's 2050 sustainability vision is still possible, but it will require a shift in the character and ambition of actions. That means both strengthening established policy tools and building on them with innovative new approaches to governance. Drawing on the insights from across the report, Part 4 identifies a variety of important areas where action is needed to enable transitions.

Strengthening policy implementation,

integration and coherence: Full implementation of existing policies would take Europe a long way to achieving its environmental goals up to 2030. Achieving full implementation will require increased funding and capacity building; engagement of business and citizens; better coordination of local, regional and national authorities; and a stronger knowledge base. Beyond implementation, Europe needs to address gaps and weaknesses in policy frameworks, for example in relation to land, soil and chemicals. Better integration of environmental goals into sectoral policy is also essential, as is improved policy coherence.

Developing more systemic, long-term policy frameworks and binding targets:

The growing set of strategic policies addressing key systems (e.g. energy and mobility) and promoting the transformation to a low-carbon and circular economy are important tools for stimulating and guiding coherent action across society. But the coverage of long-term policy frameworks needs to be extended to other important systems and issues, such as food, chemicals and land use. Comparable cross-cutting strategies are also needed at other levels of governance — including countries, regions and cities. Engaging stakeholders in developing transformative visions and pathways is important to reflect the diverse realities across Europe and to maximise environmental, social and economic co-benefits.

Leading international action towards

sustainability: Europe cannot achieve its sustainability goals in isolation. Global environmental and sustainability problems require global responses. The EU has significant diplomatic and economic influence, which it can use to promote the adoption of ambitious agreements in areas such as biodiversity and resource use. Full implementation of the UN's 2030 agenda for sustainable development in Europe and active support for implementation in other regions will be essential if Europe is to provide global leadership in achieving sustainability transitions. Using the Sustainable Development Goals as an overarching framework for policy development in the next 10 years could provide an important step towards realising Europe's 2050 vision.

Fostering innovation throughout society:

Changing trajectory will depend critically on the emergence and spread of diverse forms of innovation that can trigger new ways of thinking and living. The seeds for this shift already exist. More and more businesses, entrepreneurs, researchers, city administrations and local communities are experimenting with different

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Sustainability needs to become the guiding principle for ambitious and coherent policies and actions across society.

ways of producing and consuming. In practice, however, innovations often encounter major barriers. Public policies and institutions therefore have a vital role in enabling systemic change. Environmental policies remain essential, but system innovation requires coherent contributions from diverse policy areas, ranging from research, innovation, sectoral and industrial policies to education, welfare, trade and employment.

Scaling up investments and reorienting finance:

Although achieving sustainability transitions will require major investments, Europeans stand to gain hugely – both because of avoided harms to nature and society, and because of the economic and social opportunities that they create. Governments need to make full use of public resources to support experimentation, invest in innovations and nature-based solutions, procure sustainably, and support impacted sectors and regions. They also have an essential role in mobilising and directing private spending by shaping investment and consumption choices, and engaging the financial sector in sustainable investment by implementing and building on the EU's Sustainable Finance Action Plan.

Managing risks and ensuring a socially fair transition:

Successful governance of sustainability transitions will require that societies acknowledge potential risks, opportunities and trade-offs, and devise ways to navigate them. Policies have an essential role in achieving 'just transitions', for example by supporting companies and workers in industries facing phase-out via retraining, subsidies, technical assistance or investments that help negatively affected

regions. Early identification of emerging risks and opportunities related to technological and societal developments needs to be combined with adaptive approaches, based on experimentation, monitoring and learning.

Linking knowledge with action: Achieving sustainability transitions will require diverse new knowledge, drawing on multiple disciplines and types of knowledge production. This includes evidence about the systems driving environmental pressures, pathways to sustainability, promising initiatives and barriers to change. Foresight methods are an important way of engaging people in participatory processes to explore possible futures, outcomes and risks or opportunities. Generating, sharing and using relevant evidence to the full may require changes in the knowledge system linking science with policy and action, including developing new skills and institutional structures.

The next 10 years

Achieving the goals of the 2030 agenda for sustainable development and the Paris Agreement will require urgent action in each of these areas during the next 10 years. To be clear, Europe will not achieve its sustainability vision of 'living well, within the limits of our planet' simply by promoting economic growth and seeking to manage harmful side-effects with environmental and social policy tools. Instead, sustainability needs to become the guiding principle for ambitious and coherent policies and actions across society. Enabling transformative change will require that all areas and levels of government work together and harness the ambition, creativity and power of citizens, businesses and communities. In 2020, Europe has a unique window of opportunity to lead the global response to sustainability challenges. Now is the time to act.