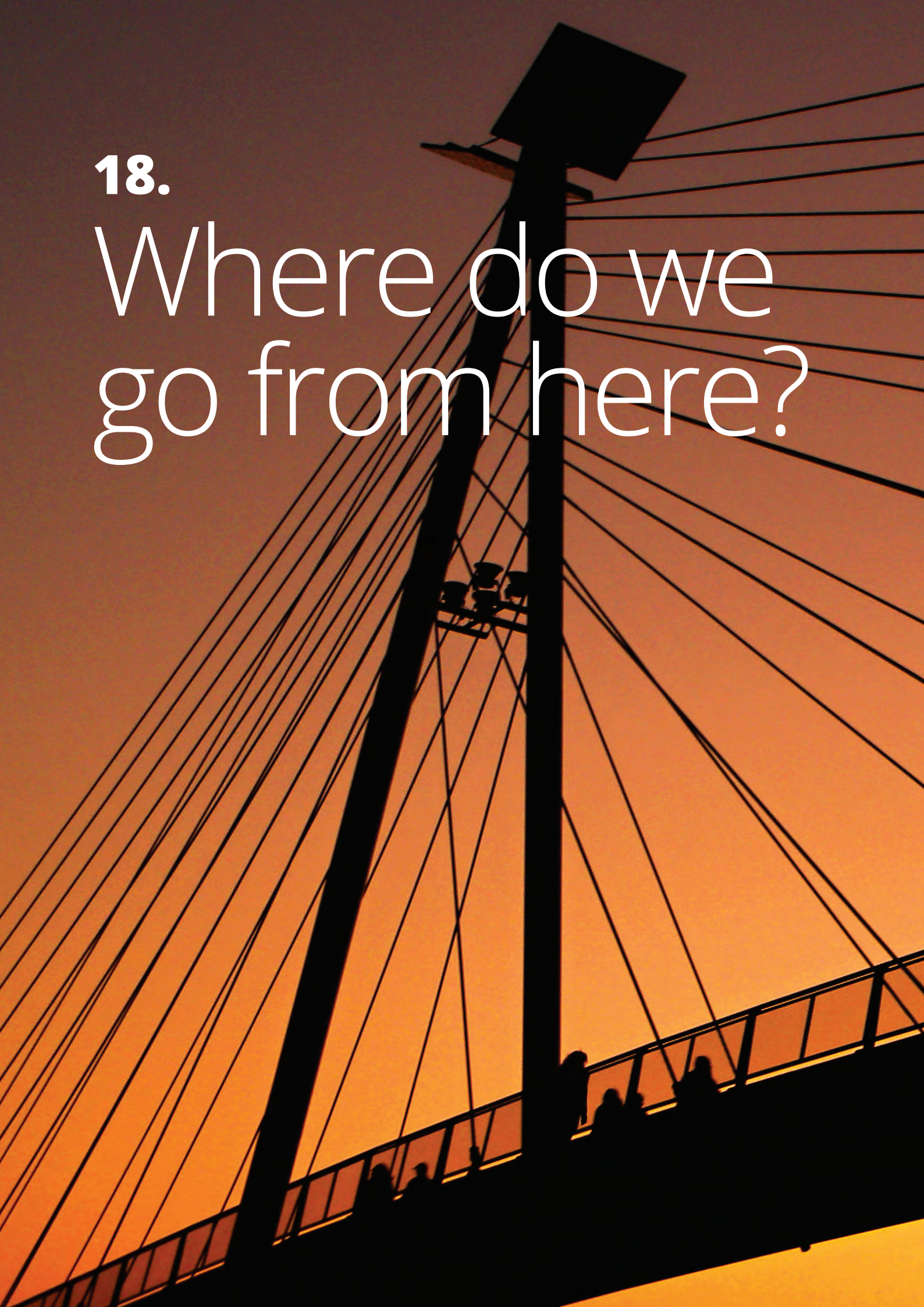

18. Where do we go from here?

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Summary

- Europe faces persistent environmental challenges of unprecedented scale and urgency. Where there has been progress on reducing emissions and impacts on human health, the improvements are insufficient to meet the long-term objectives to 2050. Such persistent challenges are resistant to traditional policy responses and could be more fully resolved if they were addressed as broader sustainability issues that cross environmental, social, economic and governance dimensions and at European and global levels. Addressing them will require policies, investments and knowledge to be brought together to transform the systems driving unsustainability while maximising the environmental, social and economic co-benefits.

- Awareness about the environmental and climate crisis is increasing across society. Citizens, businesses and communities are experimenting with new ways of living and working. Governments should harness the energy in these initiatives and encourage upscaling by supporting social and technological innovation, enabling new ways of networking and engaging stakeholders in participative governance, and ensuring socially fair transitions.

- Achieving sustainability transitions will depend on coherent contributions across all policy domains. Beyond full implementation of existing policies, this means embracing the Sustainable Development Goals as an overarching framework for policymaking and action. The EU's new body of systemic, transformative policy frameworks will also be vital in mobilising and guiding actions at different levels. However, important gaps remain, particularly for the food system.

- There are opportunities to reorient the financial flows that structure Europe's consumption and production. Governments have an essential role in investing in public goods, financing innovation and experimentation, and shaping private investment and financial markets. Key tools include fiscal reform and actions to promote sustainable finance, alongside adopting metrics to measure progress that go 'beyond gross domestic product (GDP)'.

- Sustainability transitions will require a detailed understanding of the systems driving environmental challenges and potential pathways to sustainability and their implications across society. New and more inclusive modes of knowledge production are needed, building on big data and foresight. Developing knowledge and skills will require investment in research, education and life-long learning.

- During the forthcoming EU policy cycle, Europe's leaders have the opportunity to shape future developments that will not be available to their successors. Achieving Europe's long-term sustainability goals is still possible — but it requires an immediate and fundamental shift in Europe's responses, including more concerted international action.

18.
Where do we go from here?

18.1
Critical choices in 2020

The EU and its nearest neighbours stand at a critical juncture. Despite progress in reducing some environmental pressures in recent decades, Europe faces environmental and sustainability challenges of unprecedented scale and urgency, which it cannot successfully address alone. Calls for global action are being made across science, policy and society. The Intergovernmental Panel on Climate Change (IPCC) has concluded that global CO_2 emissions need to be roughly halved during the coming decade to keep global warming to a maximum of 1.5 °C (IPCC, 2018). Global use of resources is projected to double by 2060 compared with current levels (IRP, 2019). The Earth has experienced exceptionally rapid loss of biodiversity and more species are threatened with extinction now than at any other point in human history (IPBES, 2019). Approximately 19 million premature deaths are estimated to occur annually as a result of pollution of the air, soil, water and food globally (UNEP, 2017).

The decade from 2020 to 2030 will be of vital importance in determining Europe's opportunities in the 21st century.

Overcoming these challenges is possible, but it will require a significant shift in the character and scale of Europe's responses and coordinated actions across society and internationally. Despite decades of efforts on sustainable development, humanity's impact on the environment and climate is greater than ever before. The decade from 2020 to 2030 will be of vital importance in determining Europe's opportunities in the 21st century.

In response to these challenges, Europe will need to achieve a rapid and fundamental 'transition to a low-carbon, climate-neutral, resource-efficient and biodiverse economy' (EC, 2019, p. 14). That means transforming the key societal systems driving pressures on the environment and climate and impacts on health — notably energy, food and mobility. It also means addressing the use of resources and chemicals across society and protecting biodiversity and ecosystems and their services. This means rethinking not just technologies and production processes but also governance approaches, consumption patterns and lifestyles.

The food, energy and mobility systems are crucial sources of greenhouse gas (GHG) emissions and therefore drivers of climate change. They also contribute to diverse forms of pollution, as well as land use change and landscape fragmentation. The food system has particularly far-reaching impacts on natural systems and people's health and well-being, for example through diffuse nutrient pollution. Chemical use across society also results in

widespread environmental harm, and there are few safe-by-design alternatives available yet.

There are considerable barriers to achieving systemic change at the pace and scale required. People have become acclimatised to negative messages on the state of the environment, leading to inadequate or delayed responses. For many European citizens and politicians, the costs of this inaction can feel distant and intangible. Moreover, systemic change inevitably challenges established investments, jobs, policies, behaviours and norms. This can provoke resistance from businesses, employees and society more broadly. Vested interests are one of the biggest obstacles to necessary change. The drive to maintain a competitive advantage can deter individual countries and businesses from pursuing ambitious environmental goals.

Yet there are also reasons for optimism. Some European citizens are becoming increasingly vocal in expressing their frustration at the shortfalls in environment and climate governance. Non-governmental organisations (NGOs) have taken legal action against national governments for not taking sufficient measures to fight climate change. Young people are becoming increasingly engaged and calling on policymakers to act more decisively (e.g. the school strike for climate campaign). In parallel, innovations have emerged rapidly in recent years, for example in the form of clean energy technologies and social innovations such as community energy, mobility and food initiatives. Some cities and regions are leading the way in terms of ambition. Knowledge of systemic challenges and responses is growing and is increasingly reflected in key European policy frameworks.

All of these developments are important because they create space for governments to act and bring a new scale of ambition to policy, investments and actions. They also help raise awareness, encouraging European citizens to rethink their behaviours and lifestyles. Fundamentally, the choice in 2020 is straightforward: to continue on a trajectory that puts the environment, future economic development, well-being and social cohesion at risk, or to change trajectory, setting Europe on a strong and credible development pathway to achieve a sustainable future.

The current rate of progress will not be sufficient to meet 2030 and 2050 climate and energy targets.

18.2 Challenges and opportunities

18.2.1 The main findings of SOER 2020

As demonstrated in Part 2 of this report, nature underpins and sustains human health, well-being and livelihoods. However, this foundation is deteriorating fast. Europe's success in addressing the degradation of natural systems has been limited. The majority of EU 2020 targets related to protecting, maintaining and enhancing natural capital will not be achieved. The overall objective of the EU biodiversity strategy to halt the loss of biodiversity and ecosystem services by 2020 will not be met. The outlook for 2030 is not encouraging, and achieving the Sustainable Development Goals (SDGs) dedicated to protecting terrestrial and marine ecosystems (SDGs 14, 15) and other related targets (SDGs 2, 6) is very unlikely.

In contrast, Europe has made progress in reducing pressures. GHG emissions and air pollution have been reduced while economic growth has been sustained. However, the pace of progress has slowed in relation to GHG emissions, industrial emissions, energy efficiency and the share of energy from renewable sources. This indicates the need to go beyond incremental improvements and to ensure that technology-driven efficiency gains are not offset by increasing demand. 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 impacts on biodiversity and pollution of the air, water and soil.

The global burden of disease and premature death related to environmental pollution is three times greater than that arising from AIDS (acquired immune deficiency syndrome), tuberculosis and malaria combined (Landrigan et al., 2017). In Europe, human health and well-being are still affected by exposure to air pollution, noise, hazardous chemicals and increasing risks from climate change. 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. Groups of lower socio-economic status tend to be more negatively affected. The outlook to 2030 for reducing environmental risks to health and well-being is uncertain. Current trends, coupled with important gaps and uncertainties in the knowledge base, give rise to concerns.

The interrelated nature of Europe's objectives in relation to natural capital, transforming the economy and reducing environmental risks to health and well-being mean that outcomes are determined by a complex mix of factors. Persistent environmental problems, such as loss of biodiversity, ecosystem degradation and climate change, are intertwined with economic activities and

lifestyles. For example, the way food is produced and consumed influences progress across a range of policy areas such as biodiversity and nature protection, climate change mitigation and adaptation, water quality and quantity, soil protection, the circular economy and the bioeconomy. The systemic and transboundary nature of challenges can limit the effectiveness of policy measures that do not address the root causes of environmental damage, such as unclean production, overconsumption and ecologically wasteful trade.

Although signs of progress have been observed across the food, energy and mobility systems, environmental impacts remain high and current trends are not in line with long-term environmental and sustainability goals. Achieving such goals involves addressing environmental, economic, social and governance dimensions together, bringing in the perspectives of a broad range of stakeholders, and taking coherent actions across society.

The conclusions of SOER 2020 are clear. Policies have been more effective in reducing environmental pressures than in protecting biodiversity and ecosystems and human health and well-being. Despite the achievements of European environmental governance, the outlook for Europe's environment in the coming decades is discouraging. Even in areas in which progress has been made, such as climate change mitigation, the scale of improvement needs to increase in the coming decades. Meanwhile, global megatrends, such as the continued growth in the population, economic output and the demand for resources, rising atmospheric GHG levels and worsening impacts from climate change, are intensifying environmental problems. New concerns are also emerging from technological developments and geopolitical changes, with implications for the European environment that are not clear.

Full implementation of existing policy would take the EU a long way towards achieving its environmental goals up to 2030.

In essence, Europe, along with the rest of the world, is running out of time to avoid catastrophic impacts on the economy and society from climate change, ecosystem degradation and overconsumption of natural resources. We are running out of time and space to adapt to such impacts. There is an urgent need to mitigate pressures more rapidly and restore ecosystems to support sustainability objectives.

This has implications for the development and implementation of policy and governance, investments and knowledge. But it also brings opportunities to identify more effective interventions. Embracing a wider systems perspective enables the identification of key synergies, trade-offs, lock-ins and systemic responses. For example, land use influences environmental outcomes across the food, energy and mobility systems as well as the built environment. Therefore, land use choices can play a critical role in transformation, but the interlinkages need to be considered to ensure that problems are not simply shifted elsewhere.

18.2.2 Strengthening policy implementation, integration and coherence

Since the 1970s, Europe has constructed a comprehensive set of environmental standards, founded on an unparalleled international system of monitoring, assessment and knowledge development. A growing understanding of Europe's environmental challenges increasingly highlights the need for new kinds of governance responses. Yet established environmental policy instruments, such as environmental quality standards, emissions limits and legally binding targets, remain indispensable tools for changing the trajectory towards sustainability.

As demonstrated in Part 2, Europe's environmental policy framework — the environmental acquis — has reduced some environmental pressures during recent decades while enhancing prosperity and well-being. Yet persistent weaknesses in policy implementation mean that Europe is not realising the full benefits of existing legislation. It is estimated that 420 existing gaps in the implementation of environmental legislation cost society EUR 30-80 billion annually (COWI and Eunomia, 2019).

Full implementation of existing policy would take the EU a long way towards achieving its environmental goals up to 2030. Improving implementation will depend on increased funding and capacity building, inclusive governance approaches that involve businesses and citizens, and better coordination of local, regional and national authorities. It will also require actions to strengthen the knowledge base supporting thematic and sectoral policies. SOER 2020 has identified knowledge gaps in diverse areas, ranging from marine ecosystems and environmental tipping points to drivers of resource consumption and the effects of exposure to chemicals.

Beyond implementation, there is a need to address gaps and strengthen some existing policy frameworks. Key gaps relate to land and soil and an integrated framework for environment and health, including chemicals. Binding, European-wide quantitative targets are lacking for resource efficiency, resource use, waste prevention and biodiversity. Other policy frameworks lack clearly defined steps towards long-term goals.

Better integration of environmental goals into sectoral policy is also essential. Integrating climate goals into energy policy has delivered important progress, although further integration of environmental objectives is needed, as decarbonisation can create significant pressures on ecosystems. In other areas, progress has been weaker. In the agricultural sector, environmental integration into key policies such as the common agricultural policy (CAP) has not prevented continued loss of biodiversity and environmental degradation. This points to the need for much more ambitious and far-reaching efforts. More broadly, environmental objectives could be more fully integrated into economic decision-making, through, for example, the EU's annual 'European semester' policy coordination process and improved use of Europe's system of integrated environmental and economic accounting and measures of society-wide progress that go beyond GDP.

Improving policy coherence can also enable more progress towards objectives. For instance, large subsidies for fossil fuel-based energy persist, despite ambitious climate change and clean energy objectives. Tackling diffuse nutrient (nitrogen, phosphorus) pollution will likewise require more coherent policies for agriculture, transport, industry and waste water treatment. It also requires an integrated approach across the land-sea continuum. Embracing a wider food system perspective — beyond thematic and sectoral policies — would be particularly beneficial, because diffuse nutrient pollution is also influenced by society's consumption patterns, such as in food choices.

18.2.3 Developing systemic policy frameworks

Recognising the need for coherent action across policy areas and levels of government, the EU has started to develop a series of systemic, long-term policy frameworks that address multidimensional sustainability outcomes. Some focus on particular areas, for example the Energy Union and the 'Europe on the move' agenda. Others are more cross-cutting, addressing decarbonisation and dematerialisation of the economy as a whole. Such instruments include the EU strategies for a low-carbon, circular and bio-based economy, as well as the proposed strategy for a climate-neutral Europe (EC, 2011, 2015, 2018a, 2018b). They complement established frameworks such as the environment action programmes, which enable stakeholders to come together to set priorities, contribute to stronger commitments and enhance the coherence of EU and national policies and actions.

> The coverage of long-term EU policy frameworks needs to be extended to other important systems and issues, such as food, chemicals and land use.

The new frameworks are essential. They signal a new understanding of sustainability challenges and responses, enhancing political commitment and coherence across policy areas and levels of government. Yet they are only a start. The coverage of long-term EU frameworks needs to be extended to other important systems and issues, such as food, chemicals and land use. There are already growing calls for the EU to develop a 'common food policy' (EESC, 2017; IPES Food, 2018).

It will also be important to develop comparable cross-cutting strategies at other levels of governance — including national, regional and city (EC, 2019) — and to translate strategic long-term visions and goals into ambitious and binding targets and policies. Developing concrete missions, as planned under Horizon Europe, provides a valuable means of mobilising and coordinating public and private investments and of engaging coalitions of actors in ways that can support transformative change.

18.2.4 Leading the global response towards sustainability

Europe cannot achieve its sustainability goals in isolation. Global environmental and sustainability problems require global responses. The IPCC and UNFCCC (United Nations Framework Convention on Climate Change) processes that resulted in the Paris Agreement exemplify the kinds of concerted international efforts that are needed in other environmental fields. The EU can use all its influence to ensure that current Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and Convention on Biological Diversity (CBD) work on biodiversity results in an ambitious global agreement in 2020. The EU could also push for global frameworks on resource use, building on the work of the International Resource Panel and the EU's own circular economy approach. And it could make full use of Europe's diplomatic and economic influence to promote the adoption of environmental standards at the global level and their incorporation into international trade rules.

The EU has an essential role in keeping sustainability at the top of the global agenda. Being a world leader in terms of its level of sustainability will benefit the European economy, as well as helping preserve peace and security in Europe, its neighbourhood and beyond. If action is not taken, climate change and global environmental degradation will undoubtedly lead to conflicts and forced migration, jeopardising geopolitical

stability and the international rules-based system.

The United Nations' 2030 agenda for sustainable development and the SDGs provide an essential framework for steering and coordinating these international efforts. Full implementation of the 2030 agenda in Europe and active support for implementation in other regions (e.g. through the EU's external action, development aid and trade policies) will be essential if Europe is to provide global leadership in achieving sustainability transitions. Outsourcing of unsustainable practices to other regions must be avoided, as this would undermine the other regions' efforts to achieve the SDGs. Instead, the EU should foster a level playing field for sustainability innovation worldwide and export the sustainable solutions it develops.

Global responses should also extend beyond intergovernmental approaches to embrace transnational networks of civil society organisations, subnational governments and companies. The EU could also find more ways to connect more strongly with such networks, not only from a funding perspective but also to build on their experience and know-how when setting up new international initiatives.

18.3 Enabling sustainability transitions

18.3.1 Fostering innovation throughout society

Changing trajectory will depend critically on the emergence and spread of new social practices, technologies, business models and nature-based solutions throughout society. Innovations in these diverse areas hold the potential to trigger behavioural changes and new ways of thinking and living. The seeds of this shift already exist. More and more businesses, entrepreneurs, researchers, city administrations and local communities are experimenting with new ways of producing and consuming. This diversity is essential, as it is not possible to foresee the viability and appeal of novel ideas or to anticipate their impacts and implications when taken up and used widely.

There are often major barriers and lock-ins that hinder the emergence and upscaling of innovations.

In practice, there are often major barriers and lock-ins that hinder the emergence and upscaling of innovations. Novelties may struggle to compete with established approaches that have benefited from decades of efficiency improvements. Existing technologies are often tightly linked to behaviours, cultural norms and values. Policies and market failures may further protect incumbents from competition. And systemic changes, such as the shift to renewable energy technologies or to plant-based diets, can disrupt whole sectors, leading to stranded assets and job losses. This is likely to provoke strong resistance from some businesses and consumers.

These realities point to an essential role for diverse public policies and institutions in stimulating the emergence of bottom-up solutions and facilitating system innovation. Policies can provide resources and incentives to enable experimentation and real-world piloting of new practices. They can stimulate the diffusion of promising innovations by correcting market failures, promoting the diffusion of knowledge or offering diverse incentives for their adoption. They can create an enabling framework for social innovations by creating networks, facilitating interactions and providing financial support. And they can promote the phasing out of unsustainable activities.

Environmental policies are important, for example in stimulating innovation and shaping the incentives that guide investment. But system innovation requires coherent contributions from diverse policy areas, including innovation and research, industry and sectors, education, welfare, trade and employment. Systemic policy frameworks can enable sustainability transitions by guiding and aligning actions across policy areas and scales.

The challenges of and needs for regional development are highly diverse across Europe. Local settings provide vital opportunities for experimenting with novel policy approaches and learning about what works and what does not. Innovation therefore depends heavily on the enabling environment created by local and regional governments in both urban and rural areas. Cities and municipalities have a particularly important role as hubs of innovation, often with distinct powers and capacities to network and share ideas. They are often well ahead of national governments and EU policy in terms of ambition and creativity.

18.3.2 Scaling up investments and reorienting finance

Following the economic and financial crisis of 2008, governments have focused on rebuilding public finances and returning the economy to growth. Although these are understandable goals, the potential costs of failing to tackle environmental and climate challenges continue to grow. Although achieving sustainability transitions will require major investment, Europeans stand to gain hugely — as a result of both avoided harm to nature and

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society and the economic and social opportunities that such transitions create. This implies an urgent need to prioritise and upscale investments in sustainability transitions, even if that means redirecting public funds from debt reduction in the short term.

Estimates of the investment required to achieve a climate-neutral Europe illustrate both challenges and opportunities (EC, 2018b). Modernising and decarbonising the EU economy is estimated to require additional investment in the energy system and related infrastructure of EUR 175-290 billion each year. But it would bring major health benefits, for example reducing health problems related to fine particulate matter by around EUR 200 billion per year. Cumulative savings from reduced imports of fossil fuels are projected to total EUR 2-3 trillion in the period 2031-2050. The shift to energy from renewable sources will also open up new opportunities for European countries in global clean energy markets, which are already worth EUR 1.3 trillion.

Mitigating climate change is only one part of the investment challenge. Globally, achieving the SDGs may cost USD 5-7 trillion annually (UNCTAD, 2014). Such investment looks feasible compared with total global investment of approximately USD 20 trillion (World Bank, 2019). But it will require a fundamental reorientation of public and private spending. At present, much of Europe's investment perpetuates unsustainable modes of producing and consuming, guided by market prices that do not reflect environmental and social harms.

Public investment is essential for financing sustainability transitions, particularly in areas in which market incentives for private investment are weak. This is often the case when returns on expenditure are highly uncertain (e.g. investments in innovation) or accrue to society generally (e.g. investments in public infrastructure or natural capital). Governments need to be more active in these areas by creating incentives to stimulate and direct business investment. They can also do more to facilitate household investment (e.g. in retrofitting of housing), which accounts for a substantial proportion of the spending needed to achieve climate goals. In these areas, public policies and institutions can help in overcoming the high upfront costs for households and high transaction costs for banks that are currently a barrier to the necessary investment.

Cumulative savings from reduced imports of fossil fuels are projected to total EUR 2-3 trillion in the period 2031-2050.

Environmental fiscal reform, aimed at both increasing environmental taxes and removing harmful subsidies, will be essential to correct market failures and achieve cost-effective investment. Modelling indicates that achieving long-term climate targets using pricing measures (e.g. environmental taxes, tradable permits) will require very steep increases in carbon prices in the coming years (IEA and IRENA, 2017), implying considerable political barriers. This underlines the need to design environmental fiscal reforms in ways that offset regressive impacts. It also implies a need for joined-up approaches that combine environmental taxes with tools such as feed-in-tariffs, portfolio standards, minimum performance standards, public procurement and co-financing mechanisms, such as the EU's European Fund for Strategic Investments.

Engaging the financial sector in sustainable investment is likely to require additional measures, for example developing robust and shared definitions of sustainable investment, increasing transparency and enhancing reporting requirements on environmental and sustainability risks. Accelerated implementation of the EU's sustainable finance action plan will be essential.

Much more can be done to achieve existing commitments. The EU has made little progress towards its goal of increasing R&D (research and development) spending to 3 % of GDP by 2020. The public sector also needs to ensure that investments promote challenge-led research, targeting environment- and climate-friendly innovations and nature-based solutions. Governments need to become much more active in stimulating, orienting and complementing private investments at later stages of innovation. This will necessitate greater levels of ambition, engagement and risk-taking and a willingness to accept failures alongside successes.

18.3.3 Managing risks and ensuring a socially fair transition

Transition processes are unpredictable and often produce unintended consequences and surprises. Innovations such as novel chemicals and materials can present direct threats to human and environmental health including the risk of causing irreversible harm. The interplay of innovations and social responses may produce counter-productive outcomes, as in the case of car-sharing schemes causing people to cycle or walk less. Interdependencies between systems can produce unexpected harm, such as the deforestation and increases in food prices that accompanied expanded biofuel production in the early 2000s.

Equally, however, sustainability transitions will create diverse new jobs and opportunities — often in ways that are hard to anticipate in advance.

Successful governance of sustainability transitions will require societies to acknowledge the potential risks, opportunities and trade-offs and devise ways to navigate them. The need to ensure that both benefits and costs are shared fairly across society is reflected in growing calls for just and socially fair transitions.

Policies have an essential role here, for example in supporting companies and workers in industries facing phasing out. Measures such as retraining, subsidies, technical assistance or investment can help negatively affected regions and ensure that they secure benefits from systemic change. The growing use of EU regional and innovation policy to help badly affected regions to transition towards sustainable economic sectors is a welcome development. But there is a need for more ambitious and far-reaching action.

Democratising information, enabling local action and empowering communities are key prerequisites for a just transition. There are many legitimate perspectives on desirable futures and choices on how to reach them. Effective governance requires participatory processes that enable diverse stakeholders to identify shared visions and goals and credible pathways to reach them.

Foresight approaches can help stakeholders across society to share diverse opinions and ideas, collectively visualise alternative futures, potential pathways to reach them and options for policy and action. Early identification of emerging risks and opportunities related to technological and societal developments is crucial, as are approaches that help expose trade-offs and negative cumulative impacts. In practice, however, assessing and mitigating all risks in advance is impossible. Governance of sustainability transitions must therefore apply precautionary approaches that avoid lock-ins to dangerous pathways by acting on early warnings from science and society and by promoting experimentation, monitoring and adaptive learning.

Transitions processes can be supported by ensuring knowledge is used to empower action across society.

18.3.4 Linking knowledge with action

To support existing environmental policy objectives, there is a clear need to invest in better *in situ* monitoring to address existing knowledge gaps, for example in the areas of biodiversity and soil. Europe should seize the major opportunities that digitalisation offers for knowledge production and communication. It is now possible to collect, store and process ever larger amounts of data, for example those generated by Earth observation services (e.g. Copernicus), automated sensors in the environment, and crowd-sourced contributions from citizens. Although 'big data' are currently difficult to interpret, new data analytics and artificial intelligence (AI) offer new means of doing so, providing insights into what is happening and why.

The emergence of new sustainability challenges and systemic and transformative policy responses, coupled with the desire to promote and navigate transition processes across society, creates new opportunities and demands for knowledge. These include detailed evidence about the structure, drivers and dynamics of production-consumption systems at different scales and evidence that enables societies to learn from successes and failures, to upscale promising initiatives and to identify barriers to change and unexpected consequences. Furthermore, ICT (information and communications technology) and AI should be harnessed to support decision support tools that help societal stakeholders select transition pathways and adapt them as circumstances and knowledge change.

Transitions processes also call for more systems-oriented, anticipatory and transdisciplinary approaches to knowledge and action. For example, the social sciences can provide vital insights into how to scale up social and grassroots innovations for sustainability (e.g. through practice-based knowledge), how to overcome lock-ins, conflicts and vested interests, and how to trigger individual and societal changes towards sustainable lifestyles (e.g. the link between providing information and behavioural change).

Effective science-society interfaces at all levels of governance can ensure that knowledge is understood and used to empower action across society. This requires public institutions to collaborate and combine their knowledge and skills, as well as developing new capacities and competencies, for example in relation to systems thinking, foresight and engaging stakeholders. It also means empowering citizens, for example by ensuring that lifelong education increases environmental literacy and enables active public participation in environmental protection and transitions processes.

More than ever, ensuring that relevant and credible knowledge is actually used

by decision-makers is a key challenge. In the broader societal context of increased distrust of public institutions and experts and of greater use of more decentralised, less regulated channels of information (e.g. social networks, blogs), knowledge organisations such as the EEA and Eionet (the European Environment Information and Observation Network) need to reflect on their approaches to gathering, labelling and communicating their knowledge.

18.4 The next 10 years — from ambition to action

Europe has only 30 years to achieve its long-term vision of 'living well, within the limits of our planet'. Thirty years may seem like a long time, but it is now almost five decades since the Stockholm Declaration on the Human Environment (UN, 1972). In that period, many of Europe's sustainability challenges have grown. Achieving the 2050 vision will therefore require an immediate and fundamental shift in the character and scale of Europe's response.

In 2020, Europe's leaders have the opportunity to shape future developments that will not be available to their successors. The 2030 agenda for sustainable development and the Paris Agreement provide clear international acknowledgement of the need for urgent and far-reaching action. Europe has a unique window of opportunity to lead the global response to sustainability challenges. But it faces critical choices. What should Europe do differently in 2020 and the decade that follows?

SOER 2020 points to six key areas in which bold action is needed:

- **Enable transformative change across Europe** — by harnessing the ambition, creativity and power of citizens, businesses and communities to shift towards sustainable production and consumption patterns and lifestyles. Ensure that diverse policy areas work together to enable transitions. Promote the emergence and spread of diverse ideas and innovations by helping bottom-up initiatives to learn and network. Engage stakeholders in inclusive governance processes to open up a broader range of societal responses. And ensure that transitions are socially fair, particularly for the most vulnerable in society.

- **Embrace the SDGs as an overarching framework for policymaking and implementation** — at all scales, and complement them with additional measures if the goals could be more ambitious, for example on air pollution and impacts on health. Actively support implementation of the SDGs in other regions, in particular Europe's neighbourhood. Use Europe's diplomatic and economic influence to promote the adoption of global environmental standards, including in international trade rules. And avoid outsourcing unsustainable practices that undermine other countries' efforts to achieve the SDGs.

- **Realise the unfulfilled potential of existing environmental policies** — by achieving full implementation across Europe through increased funding, capacity building, stakeholder engagement and better coordination of local, regional and national authorities. Increase public awareness of the co benefits for prosperity, security and well-being. Address gaps in policy and monitoring in areas such as land, soil and chemicals. And ensure that integrating environmental goals into sectoral policies produces significant and measurable outcomes.

- **Develop systemic policy frameworks with binding targets** — to mobilise and guide actions across society (starting with the food system and an integrated framework for environment and health). Engage stakeholders in developing transformative visions and pathways that reflect the diverse realities across Europe and maximise environmental, social and economic co-benefits. Use resource nexus and ecosystem-based management approaches to avoid burden shifting, respect environmental limits and achieve integrated management of natural resources.

- **Reorient public budgets, private investments and financial markets towards promoting sustainability transitions** — by making full use of public resources to invest in innovations and nature-based solutions, procure sustainably and support affected sectors and regions. Develop and adopt metrics for measuring society's progress towards sustainability that go beyond GDP. Mobilise and direct private spending by shaping investment and consumption choices, including through environmental fiscal reform and removing harmful subsidies. Engage the financial sector in sustainable investment by implementing and building on the EU's sustainable finance action plan.

- **Develop knowledge and skills fit for the 21st century** — focusing on understanding the key systems driving sustainability challenges and opportunities for change. Build capacity to navigate a rapidly changing world by investing in education, life-long learning and R&D programmes focused on sustainability. Harness the potential of new digital technologies to generate and share relevant knowledge that support all decision-makers to make choices consistent with pathways to sustainability.

The extent of the environmental and climate crisis is clear. Calls for action have been made across society and SOER 2020 confirms the urgent need for transformative change. Now is the time to act.