



Coherent & Cross-compliant Ocean Governance for Delivering the EU Green Deal for European Seas

Deliverable 1.1

Scoping: Concretising the policy targets and developing key scenarios



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ABSTRACT	The report presents the initial findings of T1.1 of the CrossGov project on improving coherence in marine policies within the framework of the European Green Deal (EGD). It includes a mapping exercise of the EGD's ocean-related objectives and targets, and the results from stakeholder interviews. The report emphasises the need for improving policy coherence to bridge the gap between EGD's long-term vision and current policy-making.



KEYWORDS

European Green Deal objectives and targets; EU Strategies; Oceans-related objectives and targets; stakeholders' perspectives

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Acronyms

Acronym	Full name
BALTADAPT	Baltic Sea Region Climate Change Adaptation Strategy
CAP	Common Agricultural Policy
CBD	United Nations Convention on Biological Diversity
CO ₂	Carbon Dioxide
CrossGov	Coherent and cross-compliant ocean governance for delivering the EU Green Deal for European Seas
DG ENV	Directorate-General for Environment (European Commission)
DG MARE	Directorate-General for Maritime Affairs and Fisheries (European Commission)
EGD	European Green Deal
EC	European Commission
ECA	Emission Control Area
EIA	Environmental Impact Assessment
ESPON	European Spatial Planning Observation Network
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GHG	Greenhouse Gas
GES	Good Environmental Status
GW	Gigawatts
HELCOM	The Baltic Marine Environment Protection Commission
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
MedECC	Mediterranean Experts on Climate and Environmental Change
MPA	Marine Protected Area
MSP	Marine Spatial Planning
MSSD	Mediterranean Strategy for Sustainable Development
Natura 2000	European network of protected areas
OME	Mediterranean Energy Observatory
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
Paris Agreement	Paris Agreement Under the United Nations Framework Convention on Climate Change
PBL	Netherlands Environmental Assessment Agency

Plan Bleu/RAC	Plan Bleu Regional Activity Centre
POPs	Persistent Organic Pollutants
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
SDGs	Sustainable Development Goals
UN	United Nations
UNEP/MAP	United Nations Environment Programme / Mediterranean Action Plan
VASAB	Vision and Strategies around the Baltic
WBCSD	World Business Council for Sustainable Development
WP	Work Package
WWF	World Wildlife Fund

Executive Summary

The European Green Deal (EGD) is a comprehensive set of ambitious policy initiatives launched by the European Commission in 2019, aiming, among others, to make Europe the first climate-neutral continent by 2050. It encompasses a wide range of interconnected strategies and action plans that address key environmental challenges such as greenhouse gas (GHG) emissions, biodiversity loss, pollution, renewable energy, sustainable mobility, and circular economy.

This report presents the initial assessment of the CrossGov project, focusing on improving the coherence of marine policies to manage biodiversity decline and enhance the protection of marine ecosystems. The report includes a mapping exercise of the ocean-related targets and objectives of the EGD, along with stakeholder interviews to understand the complexities of navigating diverse policies. The mapping exercise reveals that the EGD encompasses various strategies directly or indirectly linked to the ocean, covering areas such as biodiversity, climate adaptation, pollution, renewable energy, sustainable mobility, and fisheries. However, there is a lack of clear alignment and coherence among these objectives and targets, highlighting the need for greater integration. The report highlights the EGD's commitment to reconciling economic activities with environmental boundaries, emphasising decarbonisation, natural capital preservation, responsible food production, biodiversity protection, coastal resilience, zero pollution, and circular economy principles. It also identifies the EU Biodiversity Strategy for 2030, Zero Pollution Action Plan, EU Climate Adaptation Strategy, and EU Offshore Renewable Energy Strategy as key components of the EGD's marine-related initiatives.

The EGD's objectives and targets related to the ocean include both quantitative and qualitative measures, with climate and energy-related targets taking precedence. However, while climate targets have been strengthened and translated into legally binding commitments, biodiversity-related targets often lack specific quantitative metrics. The report emphasises the need for clearer connections, a comprehensive roadmap, and continuous monitoring and revision of targets to ensure effective progress. In summary, the ocean-related elements of the EGD encompass diverse objectives and targets aimed at emissions reduction, marine ecosystem protection, pollution reduction, sustainable fisheries, and renewable energy development. However, greater coherence and alignment among these objectives and targets are necessary. The report underscores the importance of continuous monitoring, revision, and implementation of legislative proposals to ensure effective progress towards a sustainable future for European seas.

The report also provides an overview of the methodology used in the CrossGov project, which includes a desk-based review of existing studies and interviews with stakeholders. The stakeholders' perspectives on navigating the EGD and its policy objectives inform the project's future activities and highlight the relevance and influence of the EGD on marine policy implementation. The report concludes by characterising the potential futures of the Baltic Sea, Mediterranean Sea, and North Sea regions, highlighting the challenges and opportunities they face in relation to climate change, pollution, biodiversity, tourism, energy, and fishing. It emphasises the need for policy coherence, coordination, and cross-sectoral collaboration to achieve the objectives of the EGD and create a more resilient and sustainable future.

Overall, the assessment aims to bridge the gap between the long-term vision of the EGD and present-day decision-making by understanding potential futures, gathering stakeholder perspectives, and identifying challenges and opportunities in achieving the EGD objectives. The findings provide valuable insights for policymakers and stakeholders to navigate towards the ambitions of the EGD and ensure effective implementation and compliance.

1. Introduction

1.1 Introduction to the European Green Deal

The European Green Deal (EGD) is a comprehensive set of policy initiatives launched by the European Commission (EC) in December 2019 to make Europe the first climate-neutral continent by 2050 (European Commission, 2019). Specifically, it was presented by the EC as a new growth strategy that purports to transform the EU economy into a sustainable one by, *inter alia*, reducing GHG emissions, tackling biodiversity loss, mitigating pollution, increasing the use of renewable energy, driving a shift to sustainable mobility and food systems, and promoting a circular economy. The plan is aligned with both the European Council's main priorities for the 2019-2024 period (European Council, 2019) and the European Parliament's call for a transition to a climate-neutral economy and society (EU Parliament, 2020). Since the launch of the EGD in 2019, more than 20 strategies have been adopted to further concretise its policy goals and create a roadmap for its implementation, such as the EU Biodiversity Strategy for 2030, the Circular Economy Action Plan, the Farm to Fork Strategy, and the Sustainable and Smart Mobility Strategy. Alongside the EGD, these strategies set out ambitious goals and targets and provide a large number of detailed actions and commitments to achieve them.

The 2019 EGD Communication (European Commission, 2019) and its subsequent strategies and action plans are closely interconnected, as they represent an integrated approach to addressing the climate, biodiversity, and pollution challenges facing the EU. These strategies and their objectives are not to be considered in isolation, but they form part of an indivisible, holistic framework. Complementing the 2019 Communication, they aim at addressing the climate, environmental, social, and economic challenges facing the EU. Together, they offer a roadmap for the EU's transition to a sustainable and climate-neutral economy, and they demonstrate the EU's commitment to achieving the objectives of the Paris Agreement and the UN Sustainable Development Goals. Instead of offering a collection of disparate policies and measures, the overarching goal of the EGD is to create synergies and coherence between the various interconnected policy areas. That approach offers in itself an added value of the EGD and also justifies the focus of CrossGov on identifying tools for improving coherence and cross-compliance.

In addition, the EGD sets a clear and ambitious long-term vision for a transition towards a climate-neutral, sustainable and inclusive European economy by 2050. This sends a strong signal and provides incentives to the Member States to create a solid and stable framework for the necessary investments and innovation and gives all the involved stakeholders a mission and a sense of clear direction. Among others, it purports to establish a balance by promoting social and economic justice: the EGD is based on the understanding that the needed rapid transition must be socially and economically just, leaving no one behind. To that end, it seeks to create new opportunities for jobs, economic growth and innovation, while also making sure that the groups that are most affected by the transition receive adequate protection. Last but not least, the EGD recognises that the current climate, energy, biodiversity crises are transcending the EU borders and require enhanced international cooperation and solidarity. In an attempt to promote the necessary international cooperation, it seeks to strengthen the EU's partnerships with other regions and countries, supporting a multilateral approach which respects the rule of law.

As a result, the EGD is perceived as one of the most significant and all-encompassing sustainability policies ever designed by the EU, covering a wide range of areas of the EU

economy, including energy, transport, agriculture, and biodiversity. The EGD is based on the recognition that environment, economy, and societal wellbeing are intrinsically linked. A sustainable future requires achieving climate neutrality and decoupling economic growth from natural resource use. This is reflected in the key EGD goals set out in the unprecedented series of EGD strategies: namely, achieving zero net GHG emissions, supplying clean, secure and affordable energy, promoting sustainable mobility, creating a toxic-free environment, encouraging the transition to a circular economy, preserving Europe’s natural capital, and designing a fair, healthy and sustainable food system (see Figure 1). Additionally, the EGD includes a Just Transition Mechanism and a Social Climate Fund to ensure a just transition for all citizens and regions, but more specifically to support regions and industries most affected by the transition to a low-carbon economy, and to harness the potential of digital technologies towards achieving sustainability.

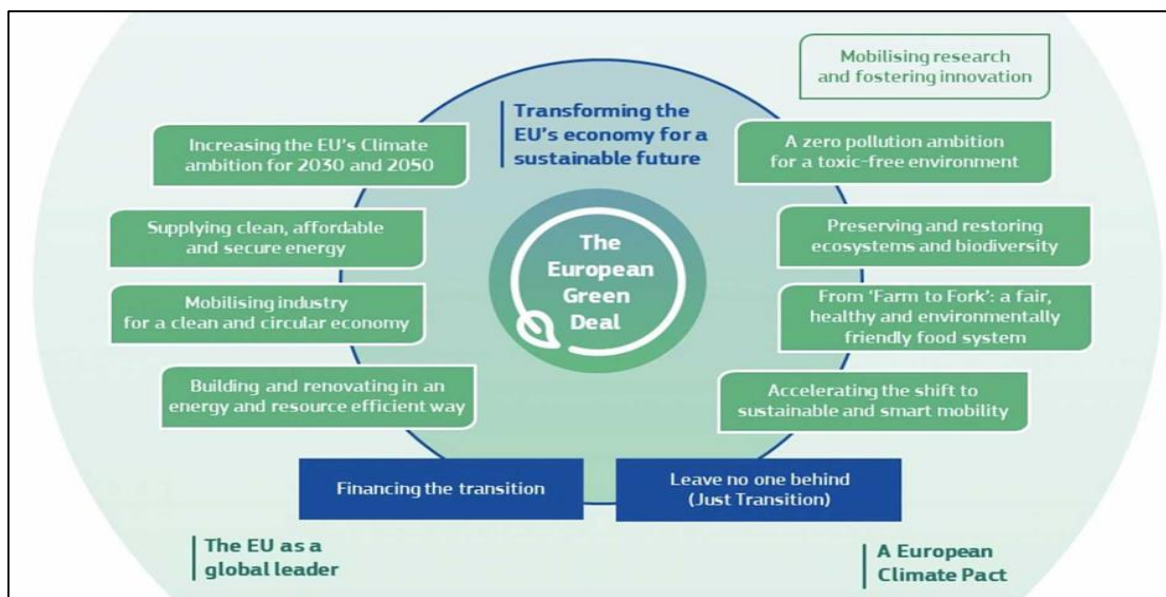


Figure 1: The EGD and its goals (European Commission, 2019).

The EU sees the EGD as an opportunity to lead the world in the fight against climate change and to create a more sustainable future for its citizens. As an overarching set of policy initiatives, the EGD needs to be implemented and developed within the already existing policies and relevant legal framework (European Commission, 2020), triggering potential conflicts but also creating opportunities for synergies. This is particularly true when looking at the implementation of the EDG in the maritime domain, which is characterised by sectoral and geographical regulatory fragmentation. As further elaborated below (see section 2), the EGD envisions that a sustainable blue economy will play a key role in both halting climate change and moving towards resource-efficient economic development (European Commission, 2019). The oceans are expected to play a significant role in contributing to renewable energy production, the greening of transport and sustainable food production.

As explained above, the EGD is rooted in the crucial understanding that the current major challenges faced by the EU require urgent action and transformative change in the way Europeans live, work, produce and consume. Many of its interconnected policy objectives are therefore focusing on tackling the thorny and urgent challenges concerning biodiversity, climate change, and pollution (Figure 2). That offers an opportunity to cluster its policy objectives in terms of the challenges they are targeting under the three streams of biodiversity,

climate change and pollution. Each stream focuses on specific goals for a sustainable future and aims to address the challenges and opportunities associated with them. While each of these streams appears to trigger a different bundle of policies and regulatory instruments, in practice, there are myriads of interconnections among them. Most of these policies are indivisible, as for instance, climate neutrality cannot be achieved without substantial progress in the zero pollution and biodiversity streams. In that sense, the three streams are used as a heuristic tool for the purposes of this task. Overall, the three streams of the EGD aim to promote sustainability in a holistic and integrated manner, recognising the interdependencies and synergies between biodiversity, climate change, and pollution.

Nonetheless, the contribution of each policy stream to the sustainability transition is expected to differ and comes with a unique set of implementation challenges. While all three policy streams are crucial for sustainability, they relate to and address different aspects of the sustainability conundrum.

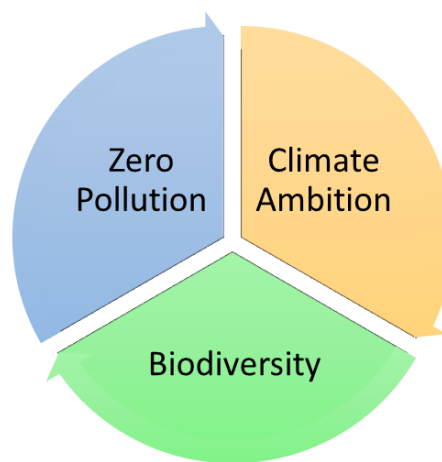


Figure 2: Representation of the three main policy streams.

1.2 The three main policy streams underpinning the EGD goals

The EGD highlights the significance of biodiversity for the well-being of people and the planet. The biodiversity stream's primary policy objective is to halt the loss of biodiversity, preserve and restore degraded ecosystems in Europe and worldwide. That is primarily operationalised by the EU Biodiversity Strategy for 2030, which includes initiatives to establish a network of protected areas, promote sustainable agriculture, fisheries and forestry, address the impacts of invasive species and wildlife trade, and promote green infrastructure. At the same time, it purports to mainstream biodiversity considerations across all policy areas and to support international cooperation to address the dramatic biodiversity loss at the global level.

The climate change stream of the EDG purports to achieve the goal of climate-neutrality by 2050, in line with the commitments of the EU and its Member States under the Paris Agreement (European Commission, 2019). In order to achieve the overarching policy goal of climate neutrality, the focus is put on two separate strands: reducing emissions (decarbonisation) and enhancing the energy transition. In terms of climate adaptation to the unavoidable impacts of climate change, it envisions that by 2050 the EU will be climate resilient, and adaptation will become smarter, more systemic and swifter (European Commission, 2021). Alongside the strengthening of EU's climate ambition for 2030 and 2050, the climate stream focuses on the supply of clean, affordable, and secure energy as well as the acceleration of the shift to

sustainable and smart mobility. It aims primarily to increase the share of renewable energy, improve energy efficiency, promote sustainable transport, and reduce GHG emissions from industry, buildings, and agriculture. The climate change stream also comes with a Just Transition Mechanism to support regions and industries most affected by the transition to a low-carbon economy (EGD Investment Plan).

The zero-pollution stream establishes an action plan to achieve a toxic-free environment in order to protect human health and the environment by reducing pollution from all sources. It mainly aims to reduce air, water, and soil pollution, promote sustainable chemicals, and address the impacts of hazardous substances on human health and the environment.

These interrelated EU ambitions (concerning biodiversity, climate change and pollution) are supported by coordinated and cross-cutting efforts towards a sustainable food system, circular economy, and smart mobility. For instance, there are strong interlinkages and synergies between biodiversity, the promotion of an environmentally friendly food system and the development of the circular economy, which can to a considerable extent reduce the environmental impact of human activities on ecosystems. Similarly, the efforts regarding circular economy and its focus on reducing waste and plastic pollution contribute towards the pollution ambition of the EGD.

Nonetheless, despite ambitions of coherence and win-win solutions, the indivisibility of the EGD policy objectives also creates trade-offs and leads to goal conflicts, as policies designed to achieve one goal may have unintended consequences and hinder the achievement of others. For example, the policy targets relating to the expansion of marine renewable energy generation may have negative impacts on biodiversity, despite the overlapping targets for enlarging the marine dimension of the Natura 2000 network of protected areas. Policies that are aimed at reducing pollution or increasing recycling of marine vessels may require the use of energy and other resources that may have negative impacts on climate change. That necessitates that policymakers carefully consider potential trade-offs alongside synergies in order to improve cross-compliance. At the EU level, the EGD policies and their implementation must be designed to, not only consider impacts on all three interrelated streams to avoid friction, but also to maximise synergies.

1.3 About this report

The present report consists of an initial assessment within the CrossGov project, a 3-year research endeavour. The project aims to improve the coherence of multi-level and multi-sectoral marine policies and their environmental and social cross-compliance. Task 1 of Work Package (WP) 1 of the project and reported here aims in particular to concretise the marine targets and objectives of the EGD and Sustainable Blue Economy Strategy. The approach taken by Task 1 was twofold. First, a mapping exercise was conducted in order to locate the EGD in its broader policy and regulatory context and to specifically identify the ocean-related targets and objectives. Second, using outcomes of the mapping exercise, interviews with stakeholders were conducted in order to gain insights into the complex array of policies, including specific and often diverse and potentially conflicting targets and objectives that stakeholders must navigate when seeking to achieve the EGD vision for 2050.

This report follows this twofold approach by explaining, in the first part, the mapping exercise and presenting some preliminary analytical insights. In the second part, the interview process is described, and the related results presented. A final part offers some overarching conclusions.

2. Mapping the EGD

2.1. Scope, methodology and approach

The ocean plays a crucial role in regulating the Earth’s climate, absorbing carbon dioxide and providing food and livelihoods for millions of people. The blue economy contributes significantly to the EU GDP and supports more than 4 million jobs (European Commission, 2022). Therefore, the EU heavily depends on the ocean from an environmental, economic as well as social perspective. In recognition of its central role for achieving sustainability, the EGD includes a number of ocean-related elements to ensure that the ocean, maritime activities and the corresponding sectoral maritime policies are included and feature prominently in the broader policy framework.

It was not until the adoption of the EGD that the EU realised that the implementation of green growth cannot be carried out with only a few splashes of blue; the green transition towards climate neutrality must take the ocean dimension on board. The ocean is, however, not at the heart of the EGD strategies. A mapping exercise was deemed necessary to obtain a clearer picture about the place of the ocean in this framework and understand which are the most relevant policy and regulatory instruments for the implementation of the EGD in European seas. The first goal of the project was then to map out and concretise the ocean related visions, objectives, and targets of the EGD. To do so, for each stream (namely, biodiversity, climate change and pollution), we identified the EGD vision and the related EGD strategies thus looking beyond the 2019 EGD Communication– as many of the visions are concretised and further operationalised in subsequent EGD related strategies. We then zoomed in, applying an ocean-focused lens, to identify the relevant objectives (*some of them may only be indirectly relevant to the ocean but will still be considered*) and targets based on the EGD, the identified strategies, and the proposed (revisions of) EU legislation.

The mapping exercise is primarily based on the EGD and the strategic documents / initiatives that have been published by the EC since 2019. We carried out an in-depth qualitative analysis of these instruments, by examining their objectives and implementation actions. We then moved on to prepare an inventory of the marine related objectives and targets per policy stream. To organise the information collected through the mapping exercise, the following table (Table 1) was created¹:

	1	2	3	4	5	6	7	8	9
	EGD vision	EGD related EU strategies	Cross-cutting EGD related EU strategies	Ocean related objectives	Ocean related targets	Related legislative proposals	Economic / financial elements	Social elements	Methods on coherence and cross-compliance
Biodiversity									
Climate change									
Zero pollution									

Table 1: Scheme of the table used for the mapping exercise.

The first five columns are descriptive in nature and aim to provide an ‘objective’ overview of the existing information under the EGD and the related strategies. The information provided in the table concerns the EU level and not the regional level (i.e., sea basins). Thus, the mapping

¹ See Annex 3, separate file.

exercise excludes the different implementing targets that may be developed under regional seas agreements. However, regional characteristics and perspectives towards these EU level EGD strategies were collected during the interaction with stakeholders.

The EGD vision in column 1 emerges from the text of the 2019 EGD Communication itself. The related strategies in column 2 have been identified based on those directly referred to in the EGD Communication. These strategies have been developed after 2019 and draw direct connections to the further development and implementation of the EGD, creating a broader EGD strategies universe. The mentioned EGD related strategies have been selected on the basis of their expected direct or indirect impact on the oceans. Direct impact strategies are the ones that directly address the issues related to the marine environment, such as marine pollution, overfishing, ocean acidification, the production of marine renewable energy, and the regulation of use of energy sources at ports. Non-direct impact strategies address issues that have significant implications for the oceans, such energy generation, industrial emissions and agriculture. As the three streams of the EGD do not exist nor operate in isolation, some strategies identified in column 1 are cross-cutting for all of them. Column 3 aims to identify those cross-cutting strategies to start thinking about where issues of coherence and cross-compliance might arise.

On the basis of the EGD vision, the identified strategies and more specific targets under these strategies, we deduced some overarching objectives for each stream. Column 4 aims to give a systematic interpretation of the analysed policy documents to link the policy efforts to the regulatory framework and developments.

For the purpose of the mapping exercise, a policy objective refers to an overarching goal or intention that guides the development and implementation of policies, representing the desired outcome or direction that policymakers aim to achieve. Column 5 then identifies the targets which are set by the EGD Communication, the identified strategies and the related legislation. These are strategic environmental goals which are provided with a deadline for their implementation. Compared to overarching objectives, targets are specific and often measurable milestones or benchmarks set within the EGD framework to track progress towards achieving the broader policy objectives. In that regard, they also provide a way to assess and monitor the effectiveness of policies and actions in achieving their desired results at a more detailed level than objectives. The project is also assessing the achievement of the broader and at more abstract level objectives, which often fill the gaps of specific targets. To shed further light on the level of ambition and novelty that the EGD targets introduced to the EU policy landscape, we have also distinguished between the 2030 targets and the 2050 targets, and between the binding and non-binding targets that already existed and the ones which have been introduced after the adoption of the EGD.

Our analysis also showed that the EC has not expressed a clear intention to translate all the targets into binding legal commitments for the Member States. To illustrate the stringency of specific targets and the priorities of the EC, column 6 illustrates the legislative proposals which have been elaborated after the adoption of the EGD and are directly linked to the implementation of identified targets. These legislative initiatives, including the revision of existing legal instruments and the adoption of new ones, are meant to ensure that the EU legislative framework becomes fit for purpose and is consistent with the new policy priorities and objectives under the EGD. In that regard, they form part of the implementation action plan of the EGD strategies. Thus, column 6 aims to give an overview of the direction taken by the legislator in order to realise the objectives of the EGD. This is instrumental in comprehending

the focus / priorities of the EU legislative bodies and the alignment of that focus (or lack thereof) with the policy goals of the EGD.

The next three columns (7-9) have a more discursive nature and will support the critical assessment of the information, which follows as a second step of this mapping exercise. For instance, some of the objectives and targets may entail a strong economic element or give priority to economic considerations over social considerations. For that reason, any gaps in the table or disproportionate number of elements under different rows/columns may be illustrative of the challenges/gaps of the EGD. The underlying idea is that the gathered information outlined in the table will facilitate identifying the potential synergies, conflicts, and gaps in and between the three main EGD streams.

To integrate the economic and social dimensions (columns 7-8), we tried to identify, whenever possible, the relevant elements under the three overarching streams. For the economic dimension, we focused on the EU blue economy vision and strategies (as it is cross-referenced in the EGD Communication); for the social dimension we looked at issues of inclusiveness (leave no one behind). The economic/financial objectives are primarily related to the objectives of a) promoting sustainable and green economic growth, b) ensuring job creation and upskilling of the workforce in sustainable industries, c) mobilising sustainable investments and financing the green transition, d) supporting research and innovation in new technologies which enhance the competitiveness of European business. The social objectives are identified on their recognised potential to promote equity and social justice, for instance by addressing the disproportionate impacts of transition measures on vulnerable communities and marginalised groups, the extent to which they promote the health and well-being of citizens by reducing exposure to pollutants and ensuring access to clean and safe environments, their potential to foster more participation in decision-making processes and ensure access to essential services.

In our analysis, we were confronted with some challenges and limitations due to the fact that the policy framework is meant to evolve and further develop in the course of time. It is also difficult to assess the ‘added value’ of the EGD in the context of the wider EU policy and legislative framework, because it would require extensive analysis to assess to what extent the EGD and its related strategies have brought about actual change in the implementation of the relevant policy and legal instruments by the EU Member States. A third limitation concerns the scope of analysis: our intention was not to give a comprehensive representation of all the strategies, objectives and targets of the EGD but instead to focus on the ones that are directly or even indirectly related to the ocean. As a consequence, we had to select and omit some strategies that may in the long term affect the ocean (such as the Circular Economy Strategy) for practical reasons relating to time and resource constraints. These choices were also partly driven by the focus of the project in the following working packages, which do not address the totality of the EGD marine related instruments, but rather focus – to ensure the feasibility and maintain the quality of the research – on a more limited number of EGD policies.

The analytical insights presented below are based on the information collected during the mapping exercise and organised through the table.

2.2 Concretising the ocean related elements of the EGD

The mapping exercise allows to emphasise two main findings relating to the on-going and future implementation of the EGD in European seas, which are discussed in the following section. First, there is a plethora of EGD strategies which directly or indirectly relate to the

ocean (section.2.2.1). Second, there is no clear correspondence between the ocean-related objectives and the ocean-related targets (section 2.2.2).

2.2.1 The EGD marine-related strategies

Table (2) offers a non-exclusive representation of the marine-related EGD strategies adopted since 2019, which complement the ocean-specific Sustainable Blue Economy Strategy:

2. EGD related EU strategies	3. Cross-cutting EGD related EU strategies ²
<p>Biodiversity EU Biodiversity Strategy 2030 and its Action Plan 8th Environment Action Plan EU Pollinators Initiative EU Action Plan on protecting and restoring marine ecosystems for sustainable and resilient fisheries Strategy for the EU’s Outermost Regions EU Global Ocean Governance Strategy 2022 (green diplomacy and leadership)</p>	<p>EU Farm to Fork Strategy (cross-reference in Biodiversity Strategy) Sustainable Blue Economy Strategy EU Offshore Renewable Energy Strategy (cross-reference in Biodiversity Strategy) Zero Pollution Action Plan (cross-reference in Biodiversity Strategy) EU Chemicals Strategy for Sustainability (cross-reference in Biodiversity Strategy) EU Strategy for Financing the Transition to a Sustainable Economy (cross reference in Biodiversity Strategy) European Green Deal Investment Plan</p>
<p>Climate Change EU Strategy on Adaptation to Climate Change Fit for 55 Package EU Offshore Renewable Energy Strategy FuelEU Maritime Initiative EU Hydrogen Strategy EU Industrial Strategy Sustainable Smart Mobility Strategy Investing in a climate-neutral future for the benefit of our people Communication on Sustainable Carbon Cycles RePower EU Energy System Integration Strategy Sustainable EU Algae Strategy Proposal for ‘Inland Navigation Action Plan 2021-2027’ (NAIADES III) EU Mission Adaptation to Climate Change Implementation Plan</p>	<p>EU Biodiversity 2030 Strategy Zero Pollution Action Plan Sustainable Blue Economy Strategy EU Action Plan on protecting and restoring marine ecosystems for sustainable and resilient fisheries European Green Deal Investment Plan</p>
<p>Pollution Zero Pollution Action Plan for Water, Air and Soil Mission Healthy Ocean, Seas Coastal and Inland Waters Chemicals Strategy New Industrial Strategy and Industry Alliances</p>	<p>EU Biodiversity Strategy 2030 Farm to Fork Sustainable Blue Economy Strategy EU Action Plan on protecting and restoring marine ecosystems for sustainable and resilient fisheries European Green Deal Investment Plan</p>

Table 2: Summary of the EGD related EU strategies and cross-cutting EGD related EU strategies.

The EGD promises to deliver a series of transformative policies that could reconcile the economy, the way we produce and consume, with the planet’s boundaries for the benefit of people. The crises caused by Covid-19 and the illegal war against Ukraine risked derailing the implementation of the EGD, as they stressed the need for economic recovery. At the same time,

² These strategies have a rather cross-cutting nature, as they closely connected to more than one streams.

however, they aptly illustrated the need to step up the ambitions under the EGD and become less dependent on high carbon-emitting fossil fuels. Notwithstanding these crises, the EC has been extensively engaged with translating its general policy goals into concrete policy strategies with more tangible objectives and targets. An EU strategy is a set of objectives, policies, and actions that are developed by the EC, in collaboration with other EU institutions and Member States, to address a particular issue or challenge facing the EU. Strategies are designed to provide a coordinated and comprehensive approach to policymaking and implementation at the EU level, with the aim of achieving specific goals in areas such as the environment, energy, research and innovation, social affairs, and foreign policy.

As mentioned in the introduction, the EGD inserts itself in an already crowded policy and regulatory landscape and, in line with its holistic ambitions, triggers several policy fields and related strategies. Beyond the strategies developed to directly answer the primary objectives of the three EGD streams (i.e., EU Biodiversity Strategy 2030 and its Action Plan, EU Strategy on Adaptation to Climate Change and the Zero Pollution Action Plan for Water, Air and Soil), bundles of strategies, dealing with various sectors and issues, are clustered around these streams.

The EU has developed several ocean-related strategies and policies. Some preceded the adoption of the EGD, like the Integrated Maritime Policy, the maritime transport policy, and the Common Fisheries Policy. Others directly stem from the EGD, like the Sustainable Blue Economy Strategy. At the core of the Sustainable Blue Economy lies the understanding that blue economic sectors, such as the exploitation of marine living and non-living resources, ports, shipbuilding and recycling, maritime transport, tourism, and aquaculture, are perceived as fundamental for both ecological and economic restoration within the EU. Moreover, the Sustainable Blue Economy Strategy emphasises that ecological and economic restoration in European Seas are intrinsically linked. This is why the expansion and strengthening of marine biodiversity protection and restoration are integral parts of the Strategy besides the contribution of the ocean to the expansion of renewable energy generation, the greening of maritime transport (and ports) and sustainable (sea)food production. The main goals of the Strategy are respectively; decarbonisation of the maritime sectors, preservation of natural capital, responsible food production, biodiversity and investing in nature, coastal resilience, zero pollution and circular economy (see Sustainable Blue Economy Strategy, 3-10). The priorities set out in the Sustainable Blue Economy Strategy are an integral part of the EU's action plan to achieve a clean and circular economy, mitigate climate change, protect and preserve biodiversity, as well as minimise pollution.

The EU Biodiversity Strategy for 2030 includes more than 100 specific actions that purport to protect and effectively manage at least 30% of the EU's land and seas (putting at least 1/3 of protected areas under strict protection) and promote an ambitious nature restoration agenda, including measures to improve the management of existing Marine Protected Areas (MPA) and enhance their connectivity to ensure their effectiveness in conserving marine biodiversity. To that end, the EC has proposed the Nature Restoration Law, which aims at halting biodiversity loss and at the same time tackling the climate crisis. Besides, the Biodiversity Strategy calls for increased financial support for nature-based solutions (for instance, it provides that 30% of the EU Maritime and Fisheries Fund should be channelled into climate action). It also promotes measures to support sustainable fisheries and aquaculture, calling for the use of ecosystem-based approach to fisheries management, which duly considers the interactions between species and the wider marine ecosystem. Overall, its application to the

marine ecosystem can be a crucial step towards ensuring the long-term health and sustainability of the marine environment.

The Zero Pollution Action Plan contains an overarching commitment toward achieving zero pollution, embracing the prevention principle. The Plan incorporates targets on air pollution, chemical pesticides, nutrient loss, plastic and other forms of waste, improving the implementation and enforcement of existing pollution legislation, promoting sustainable and low-emission shipping and renewing commitments for the updating of water and air quality standards in the EU. It calls for the implementation of the EU's Water Framework Directive and the Marine Strategy Framework Directive, which set targets and contain indicators for the quality and ecological status of EU waters. In addition, the Zero Pollution Action Plan includes measures to improve the monitoring and reporting of pollution levels in the marine environment. The targeted improvements in the collection and analysis of data on marine pollution could improve the understanding of the long-term and cumulative effects of pollution on marine ecosystems and human health. It is complemented by the EU Chemicals Strategy for Sustainability in 2030, which addresses the release of chemicals, which can also have negative impacts on marine ecosystems, by proposing measures to control and restrict the use of certain substances.

The EU Climate Adaptation Strategy highlights the role of the ocean for climate change resilience. In particular, it stresses the importance of protecting and restoring wetlands, peatlands, coastal and marine ecosystems to improve the adaptive capacity of the EU's coastal areas to climate change and at the same time contribute to a multitude of other EGD objectives (i.e., biodiversity protection and restoration, creation of new 'blue' jobs). These nature-based solutions are expected to steer innovation for increased climate resilience, increased capacity to address extreme weather effects and sea level rise as well as creating a new sector of the blue economy. The strategy equally emphasises the importance of protecting and restoring marine ecosystems as a way of increasing their resilience to climate change impacts. For instance, measures for the restoration of coastal ecosystems which can operate as natural buffers against extreme weather events. In addition, it includes measures for the development of new technologies and approaches to monitor and predict the impacts of climate change on the marine environment, as well as development of strategies that duly consider the complexity and interconnectedness of marine ecosystems.

The EU Offshore Renewable Energy Strategy further highlights that marine renewables can be a useful tool in achieving the 2030 and 2050 climate goals of the EU, especially if combined with the decarbonisation of maritime transport and fisheries. The strategy focuses on the development of different forms of marine renewable energy, including wind, wave and tidal energy and aims at the same time to promote a sustainable use of the marine environment and its resources. The strategy highlights the relevance of conducting environmental impact assessments (EIAs) to assess the potential impacts of offshore renewable energy projects on marine biodiversity. It also stresses the need to establish spatial plans to ensure that such projects are located in areas that are appropriate from an environmental, economic and social perspective. It also focuses on the importance of stakeholder engagement and consultation in the development of marine renewable energy projects, such as local communities, environmental organisations, and other stakeholders in the planning and decision-making process. To support the interaction between different stakeholders operating in the various marine sectors, the EC has proposed the establishment of a Blue Forum for users of the sea to kick-off a dialogue between various stakeholders in the offshore industries (renewable energy, shipping, tourism, aquaculture, fisheries).

The Sustainable and Smart Mobility Strategy includes measures to further promote the use of sustainable and low-emission transport, including maritime transport, to promote the use of alternative fuels (such as biofuels, hydrogen and electricity), to reduce GHG emissions and improve air quality. In addition, the strategy includes measures to promote the development and use of digital technologies in transportation. This can include the use of digital platforms to optimise the efficiency of transport networks, which can assist in minimising the impact of transportation for the environment. Some of the maritime transport related goals of the Sustainable and Smart Mobility Strategy are also found in the 2030 Climate Action Plan, which for instance also calls for measures to mitigate the climate impact of maritime transport, or measures to promote the use of marine renewables.

Better use of living resources is also expected to assist in alleviating biodiversity and climate crises. **The Farm to Fork Strategy** has emphasised the need for more responsible and sustainable food systems. In that regard, the EC has recently published a series of initiatives for the greening of fisheries and aquaculture activities that will bring about a transition to more sustainable food production, as well as a dedicated initiative on algae to support the development of the respective industry.

2.2.2 Ocean related objectives and targets

4. Ocean related objectives (our interpretation of the overarching objectives)	5. Ocean related targets
<p>Biodiversity Protect and restore marine biodiversity.</p> <p>Reduce marine pollution.</p> <p>Achieve sustainable fisheries.</p> <p>Support transition to a sustainable blue economy (transport, renewables, marine technologies).</p> <p>Strengthen international ocean governance cooperation to protect the oceans, promote sustainable fisheries and combat climate change.</p>	<p>By 2030: Legally protect a minimum of 30% of the EU’s seas area and integrate ecological corridors (new target).</p> <p>Strict legal protection of at least a third of the EU’s protected areas (new target).</p> <p>Significant areas of degraded and carbon rich ecosystems are restored, habitats and species show no deterioration in conservation status and trends, at least 30% reach favourable conservation status or at least show a positive trend (extends deadline – see Habitats Directive).</p> <p>Effectively manage all protected areas (<i>similar to the Habitats Directive</i>).</p> <p>Negative impacts on sensitive species and habitats, including on the seabed, through fishing and extraction activities, are substantially reduced to reach a good environmental status (extends deadline see MSFD).</p> <p>The by-catch of species is eliminated or reduced to a level that allows species recovery and conservation.</p> <p>50% reduction in the number of Red List species threatened by invasive and alien species (quantified already existing goal in EU Invasive Species Regulation) (European Commission, 2021).</p> <p>Significant increase in organic aquaculture (new target) (European Commission, 2020a).</p>



	<p>By 2050: cover all ecosystems in need of restoration (extends deadline) (European Commission, 2021).</p>
<p>Climate Change Reach climate neutrality by 2050 (economy with net-zero GHG emissions) in line with the EU’s commitment to global climate action under the Paris Agreement.</p> <p>Increase share in renewable energy.</p> <p>Accelerate the permitting process for renewable energy projects.</p> <p>Improve energy efficiency.</p> <p>Integrated energy system.</p> <p>Decrease emissions from maritime transport – use of sustainable fuels by vessels and at ports.</p> <p>By 2050: the EU is climate resilient, and adaptation is made smarter, more systemic and swifter.</p>	<p>By 2030:</p> <p>55% GHG emissions reduction – including removals - compared to 1990 (legally binding target, already existed as non-binding).</p> <p>35% of non-CO2 GHG emission reduction compared to 2015 (new target).</p> <p>Coal, oil and gas consumption decrease, respectively, by 70%, 30% and 25% (new target) (European Commission, 2020b).</p> <p>All sectors covered by the revised EU ETS will reduce GHG emissions by 61% compared to 2005 levels (enlarged scope) (European Commission, 2021a).</p> <p>Net sink of 310 million tons of CO2 (new target) (European Commission, 2021b).</p> <p>60GW wind energy and at least 1GW ocean energy– <i>made specific to offshore renewables and quantified</i>) (European Commission, 2020c).</p> <p>Produce up to 10 million tonnes of renewable hydrogen (specified for renewable hydrogen and quantified) (European Commission, 2020d).</p> <p>35% of non-CO2 GHG emission reduction compared to 2015 (new target).</p> <p>Coal, oil and gas consumption decrease, respectively, by 70%, 30% and 25% (new target).</p> <p>Methane emissions decrease by 35% compared to 2005 (new target) (European Commission, 2020e).</p> <p>First zero emission vessels in the EU market (new target).</p> <p>Transport by inland waterways and short sea shipping increases by 25% (new target) (European Commission, 2020f).</p> <p>By 2050: climate neutrality (legally binding target) (European Commission, 2021c).</p> <p>300GW offshore wind and 40GW ocean energy – offshore renewables are a core component of Europe’s energy system (specified and quantified) (European Commission, 2020c).</p> <p>90% reduction of GHG emissions from all modes of transport, including maritime transport (higher than previous target).</p>

	transport by inland waterways and short sea shipping increases by 50% (new target) (European Commission, 2020f).
<p>Pollution Include pollution prevention in all relevant EU policies, maximising synergies in an effective and proportionate way, stepping up implementation and identifying potential gaps or trade-offs.</p> <p>Zero emission ports (see also Sustainable and Smart Mobility Strategy).</p> <p>Prevent waste (single-use plastics, lost or discarded fishing gear and waste discarded from ships).</p> <p>Align the EU air quality standards with WHO recommendations & review quality of water standards and EU waste laws to ensure that they implement the green circular economy principles.</p> <p>Support innovation and implementation of EU policies and laws to achieve healthy, pollution-free oceans, seas and waters.</p> <p>Protect citizens and the environment against hazardous chemicals and encourage innovation for the development of safe and sustainable alternatives, by: (i) simplifying and strengthening the legal framework, (ii) improving cooperation and transparency between EU agencies and scientific bodies and (iii) ensuring that the regulatory framework rapidly reflects scientific evidence on the risk posed by hazardous chemicals.</p>	<p>By 2030: Reduce the number of premature deaths caused by air pollution by 55%.</p> <p>Reduce by 25% the EU ecosystems where air pollution threatens biodiversity.</p> <p>Halve litter at sea (50% reduction of plastic litter and 30% of microplastics) (new target) (European Commission, 2021d).</p> <p>Use and risk from chemical pesticides is reduced by 50 % and no chemical pesticides are used in sensitive areas (new target) (European Commission, 2020).</p> <p>By 2030: nutrient losses from fertilisers reduced by 50%, reduced use of fertilisers by 20% (quantified and extended deadline).</p> <p>Reduce overall EU sales of antimicrobials in aquaculture by 50% (new target).</p> <p>Threshold value on beach litter (less than 20 litter items per 100 meters coastline – new target) (European Commission, 2020).</p>

Table 3: List of the ocean related goals and targets.

We have above identified a large number of targets which need to be achieved by 2030, some even for 2050, and which concern the three environmental streams of the EGD. One can easily observe that the majority of these targets relate to climate and energy, followed in the second place by those on biodiversity and in the last place the ones devoted to zero pollution. Many policy targets are quantitative, meaning that they are expressed in specific numerical terms. For instance, targets regarding GHG emissions reduction to be achieved by a certain year. Similarly, targets for renewable energy define a specific percentage or amount of energy to be generated from renewable sources. However, they often do not necessarily define the precise percentage that has to be developed per Member State, which affects their level of discretion in the implementation of the EGD. At the same time, there are policy targets that are qualitative in nature. That is mostly the case when it comes to targets related to biodiversity, which aim to halt the loss of biodiversity, restore degraded ecosystems, or enhance the resilience of ecosystems without providing specific quantitative metrics (with the exception of the targets of expanding the protected areas under the Natura 2000 Network).

It is perhaps unsurprising that the vast majority of them must be accomplished by 2030. Only a handful of very broadly phrased targets are set for 2050, without any specific roadmap for the action that must be taken between 2030 and 2050. It is, of course, important to note that these objectives and targets are subject to periodic revision and may evolve over time based on scientific advancements, policy developments, the level of urgency of specific measures and the EU's overall progress in implementing the EGD.

Through the comparative analysis of the various objectives / targets of the EGD with previous policy instruments, we were able to make some insightful observations. In terms of climate ambition, it is noteworthy that earlier GHG emission reduction targets have been raised after the EGD and, alongside the net-zero / climate neutrality target by 2050, have crystallised as legally binding targets under the European Climate Law in 2021 (European Commission, 2021c). By 2030, the renewable energy sources target is proposed to be raised to 45% (see RePowerEU). The quantitative objectives also entail strengthening the role of marine renewables and renewable hydrogen. In terms of reducing GHG emissions from transport, the Smart Mobility Strategy sets the goal of introducing the first zero-emission vessels in the EU market by 2030. Many of these targets are coupled with planned legislative proposals which can shape a stricter implementation framework. The majority of the so far tabled proposals for revision or introduction of new legislative instruments concern climate change mitigation and energy. Nonetheless, due to the indivisibility of the EGD targets, the revision of other legislative instruments, such as the energy related directives, is also expected to greatly influence biodiversity conservation and protection in the context of the ongoing energy transition. In comparison, the climate adaptation objectives and targets are largely stagnant, even though there is an explicit recognition of the significant role of the ocean and aquatic environments for climate resilience.

In the biodiversity stream, the primary ambition of the EGD is to ensure that by 2050 all the world's ecosystems are protected and restored to a level that resilience is ensured. Similar environmental objective had been established by the preceding EU Biodiversity Strategies. In order to avoid the pitfalls of the past EU environmental policies, the EGD Strategies contain several innovative or enhanced commitments to achieve the overarching biodiversity vision. For example, the 2030 Biodiversity Strategy stresses the need to legally protect at least 30% of the EU's marine area and adopt measures for the strict protection, management, and conservation of a third of the MPAs. Several targets purport to reduce the negative consequences of economic activities at sea on marine ecosystems, reduce the by-catch of threatened marine species and increase sustainable aquaculture. Despite the existence of many qualitative targets (especially compared to the number of quantitative objectives regarding climate change and energy), it is noteworthy that some of the biodiversity-related objectives have also been quantified. The proposal for binding nature restoration targets by the EC is also a considerable development, which was necessary to couple the ambitious biodiversity goals with binding legal obligations. That development has a considerable potential to enhance the adoption of the prescribed biodiversity related measures in an EU policy area that has been traditionally undermined by voluntary commitments, which allowed EU Member States a wide discretion in their implementation and enforcement. Nonetheless, with the exception of the MSFD, there is yet no plan for the revision of core biodiversity EU legislation (Nature Directives). The most pressing problem is the potential mismatch between the revised Common Agricultural Policy (CAP) and the EGD goals.

The objectives concerning pollution appear quite similar to the ones under the pre-existing EU policy framework, with the exception of the more specific targets relating chemicals and the use of pesticides. The new objectives for the reduction of plastic litter at sea and microplastics released in the environment (in general) are equally noteworthy from a marine environmental protection perspective. The EC's legislative proposals are primarily focused on strengthening the existing regulatory tools in this policy stream.

3. Summary: The coherence of the ocean-related objectives of the EGD

The EGD includes several ocean-related objectives and targets, which can be summarised as follows:

- Reducing GHG emissions from the maritime sector: The EGD aims to reduce emissions from shipping by at least 50% by 2050, compared with 2008 levels, and to explore the potential of alternative fuels and zero-emission ships.
- Protecting marine ecosystems: The EGD includes a target of protecting at least 30% of EU sea area by 2030, through the establishment of MPAs, integrated ecological corridors and other conservation measures. The EGD further includes a target of strictly protecting at least 10% of EU sea area by 2030.
- Reducing marine pollution: The EGD aims to reduce marine plastic litter by 50% by 2030, through measures such as improved waste management, better fishing practices, and increased awareness-raising.
- Promoting sustainable fisheries: The EGD includes a target of achieving sustainable fisheries in the EU by 2030, through the implementation of the Common Fisheries Policy and the reduction of overfishing, tackling harmful fishing methods and by-catch.
- Supporting the development of renewable energy: The EGD aims to increase the share of renewable energy in the EU's energy mix, including in the offshore wind sector.
- Fostering sustainable blue economy: The EGD promotes the development of a sustainable blue economy that supports the delivery of EGD objectives on biodiversity, climate change and pollution and contributes to a climate neutral and resilient economy and prosperous society in the EU.

These objectives and targets reflect the EU's commitment to promoting sustainable development in the maritime sector, while also protecting the ocean and its ecosystems, recognising that the two are intrinsically linked. For these reasons, several potential synergies and conflicts can be identified between the EGD objectives.

3.1 Potential synergies between EGD objectives

Climate and Energy

A strong synergy is evident when it comes to the climate and energy objectives under the EGD. The focus on decarbonisation of the economy, renewable energy and energy efficiency largely aligns with the goal of climate change mitigation. Offshore renewables are projected to play a pivotal role in both decarbonisation and meeting the increasing energy demands of the blue

economy. The European seas present vast opportunities for offshore renewable energy production, primarily offshore wind and wave energy.

Climate and biodiversity

Conserving and restoring biodiversity is equally crucial for climate change mitigation and adaptation. Protecting marine ecosystems, such as seagrass beds, salt marshes and mangroves, which serve as natural carbon sinks assists in GHG sequestration and the regulation of the global climate. Moreover, ecosystem resilience is vital for contributing to the ability of marine ecosystems to adapt to changing climate conditions. The incorporation of nature-based solutions into climate strategies can facilitate the simultaneous enhancement of both climate and biodiversity action.

Climate and pollution

Tackling climate change can lead to a significant reduction of pollution caused by GHG emissions. Policy goals relating to decarbonisation and rollout of marine renewables can result in decreased dependency on fossil fuels, leading to a reduction of pollution which is often absorbed by the marine environment. Reducing pollution from plastic waste, chemical and nutrients is indispensable for protecting EU seas. Enhancing the resilience of the ecosystems better support mitigation and adaptation nature-based solutions to climate change. Such synergies in the implementation of pollution prevention and reduction measures can be leveraged to improve both human health and the ecological status of marine ecosystems.

3.2 Potential frictions between EGD objectives

Energy and biodiversity

The proliferation of offshore renewable energy infrastructure can cause frictions with the objectives of protecting and restoring marine biodiversity. The installation of offshore wind farms, for instance, may affect sensitive species and their habitats, including marine mammals, fish, and sea birds. For that reason, it is crucial to carefully plan and design such energy projects, taking duly into account the ecological characteristics and particularities of different marine areas. Besides, that risk highlights the need for adopting and strictly implementing measures to minimise the negative impact of such infrastructure on marine biodiversity. Stakeholder engagement, environmental impact assessments which consider the cumulative effects of different marine uses, and the establishment of area-based conservation management measures can assist in addressing the potential frictions and ensure the sustainable coexistence of offshore renewables and marine biodiversity.

Energy and pollution

Although offshore renewables contribute to climate change mitigation, the installation and operation of energy infrastructure may generate pollution. This includes noise pollution, accidental oil spills and the release of hazardous substances in the marine environment. The development of relevant environmental regulation and best practices concerning risks management procedures are necessary to mitigate any potential frictions.

4. Connecting the long-term EGD vision with present-day decision-making

4.1. Methodology and approach

The second overarching objective of this report is to connect the EGD's long-term (2050) vision and its multiple policy targets with present-day decision-making. To do this, possible "futures" for each of the target regions (sea-basins) covered by CrossGov were developed based on existing studies. In a second step, stakeholders were selected and interviewed to gain an understanding of their perspectives on navigating the EGD when considering multiple policy objectives and potential futures.

4.1.1. Characterising future influences on policy implementation

A desk-based review of existing studies on trends, developments, and foresight scenarios regarding climate, biodiversity, pollution, shipping, tourism, energy, and fishing was conducted, focusing on EU and regional studies. The aim of this review was to understand how these studies characterise the future of the three regions of focus in CrossGov – the Baltic Sea, Mediterranean Sea, and North Sea regions – up to 2050, especially regarding biodiversity, pollution, and climate aspects. The analysis considered the degree of alignment between the futures identified in these studies and the EGD vision, as well as the extent to which policy coherence and cross-compliance, or related aspects (e.g., policy integration), were considered within the studies. This review facilitated an understanding of the potential challenges and opportunities that these regions may face in the coming decades, and provided insights on the interplay between policy design, implementation, and the objectives of the EGD.

A total of 40 studies were identified and reviewed, encompassing policy documents, academic studies, presentations, and reports. The search terms employed included: *Baltic Sea, Mediterranean Sea, North Sea, future, 2050, Green Deal, foresight, vision, policy coherence, climate change, biodiversity, pollution, tourism, shipping, energy, and fishing*, among others. The resulting studies were published between 2013 and 2022 and the majority focused on sectoral developments and specific trends, with only a small fraction presenting integrated (e.g., cross-sectoral, regional) foresight and scenario studies. The Mediterranean Sea region, in particular, was prominently featured in the reviewed literature.

4.1.2. Consolidating stakeholder perspectives on navigating the EGD

After characterising the expected futures of the three regions investigated, a diverse group of stakeholders was selected and interviewed with the aim to better understand what policies influence their decision-making and how they, as individuals within diverse organisations, navigate the complex array of policies related to the EGD, including specific targets and objectives which are diverse and potentially conflicting.

Ten stakeholders (see Table 4) were targeted for interviews, across the sea basins within the CrossGov project (Baltic Sea, North Sea, and Mediterranean Sea). Stakeholders were selected to ensure broad coverage across the project's case studies. The stakeholders were chosen based on their expertise in pertinent sectors or project interests, as applicable to the case study topics. Stakeholders came from national, regional, and/or EU levels of policymaking, with some offering insights across multiple sea basins or topics (e.g., biodiversity and climate change). Efforts were made to identify a diverse array of stakeholders to cover a broad number of topics without overlap.

Ten stakeholders were interviewed in semi-structured interviews. Interviews were conducted both face-to-face and through online tools (e.g., Zoom). An interview protocol and guiding

questions (see Annex) were created to facilitate the interviews, although it is important to note that, depending on the specific context of each interview, these guiding questions were sometimes adapted to best suit the respective interview scenarios.

Number of participants	Affiliation
1	Anonymous
1	Coalition Clean Baltic
1	European Commission, DG Environment
2	European Shipping Council (ESC)
1	Finnish Maritime Spatial Planning Cooperation
1	Independent Consultant, Offshore Wind Energy, Norway
1	Ministry of the Environment Finland
2	Plan Bleu
1	WWF Italy

Table 4: Stakeholders interviewed for the assessment (listed in alphabetical order).

4.1.3. Outcomes

The methodology implemented in this study generated a range of valuable outcomes for the CrossGov project. This includes the creation of a shared understanding of the EGD vision, grounded in the synthesis of stakeholder perspectives, which will underpin WP2 and WP3 activities. Moreover, stakeholders generally agreed that the targets, objectives, and EGD vision, were both highly relevant and influential for their efforts and activities within various realms of marine policy implementation.

The methodology facilitated an initial comprehension of the challenges and opportunities (i.e., pre-screening) associated with achieving specific policy targets, objectives, and the EGD vision pertinent to CrossGov (WP2-4). It also provided a characterisation of potential shifts in the key elements of CrossGov (e.g., biodiversity, pollution, climate, sectors) that may influence policy implementation and the progression towards the EGD. Furthermore, by consolidating stakeholder perspectives on navigating the EGD, the research captured diverse viewpoints on the complex array of policies within the decision-making process, shedding light on the specific targets, objectives, and potential conflicts that may arise in the context of the EDG.

5. Characterising the future of European Sea basins: the Baltic Sea, Mediterranean Sea, and North Sea regions

The Baltic Sea, Mediterranean Sea, and North Sea are complex regions that are witnessing numerous social, economic, and environmental changes, which together with policy responses will have a significant impact on the achievement of the EGD and its objectives. The regional (i.e., sea-basin) level is highly important for the implementation of EU policies and the EGD as they are areas that share common environmental challenges, sectoral activities, and are often important for coordination between states, including both EU Member States and non-EU States, and stakeholders.

This summary provides an overview of studies focused on characterising the ‘futures’ of the Baltic Sea, Mediterranean Sea, and North Sea regions, up to 2050. The document aims to

identify whether futures (e.g., trends, developments, expectations, challenges) identified in the reviewed literature are in line with the EGD vision and whether policy coherence and cross-compliance (or some variation of these concepts) are considered in the reviewed studies. This is done to gain a better understanding of the challenges and opportunities that these regions will face in the coming decades and gather insights on the relationship between policy design and implementation, expected developments and the goals of the EGD. The review focuses on key sectors of the regions and the main policy streams of EGD - climate change, pollution, and biodiversity. In this regard, the section includes some reference to regional strategies and action plans relevant to the achievement of the EGD but not included in the first half of this report.

The three regions examined in this study - the Mediterranean Sea, Baltic Sea, and North Sea - will face various challenges, developments, and transformations over the coming decades, though some aspects remain highly uncertain. Climate change poses a significant threat to all three regions, with the Mediterranean Sea basin expected to experience the most severe impacts. In the context of the EGD, each region has implemented regional plans that align with the overall objectives of the initiative. However, there is a pressing need to enhance policy coherence and coordination among the different countries involved. Fostering constructive cooperation with neighbouring non-EU countries in the Baltic Sea and Mediterranean Sea will be important for regional advancements towards the objectives set forth by the EGD.

Cooperation between EU Member States and non-EU countries within these regions plays a potentially important role in addressing regional challenges and achieving a regional vision aligned with the EGD. EU Member States are directly involved with the achievement of the EGD through design of EU policies and their implementation. However, the involvement of neighbouring non-EU countries is equally crucial as challenges such as climate change, biodiversity loss, pollution, etc. are transboundary in nature and do not respect national borders.

In this regard, the future of these regions will be shaped by the interplay between EU Member States and non-EU States. The success of the EGD and other EU policies in these regions will be supported through collaboration towards shared goals, while respecting the diverse needs and capacities of all states.

5.1. The Baltic Sea region

The Baltic Sea region made up of EU Member States, including Sweden, Finland, Denmark, Estonia, Latvia, Lithuania, Poland, and Germany as well as Russia, a non-EU State. Over the next decades, demographic changes together with the impacts of climate change, technological innovation, and micro and macro-economic developments will shape the Baltic Sea region (VASAB, 2022). The Baltic Sea region (i.e. catchment area) is home to more than 85 million people (HELCOM, 2018). Although population is expected to decline in the region, especially between 2030 and 2050 due to aging population in rural areas of northern countries (ESPON, 2019; ESPON, 2020), it is expected to experience significant economic growth and diversification, particularly in regard to renewable energy. Several sectors are likely to be particularly important drivers of economic development in the region such as maritime industry, tourism, renewable energy, and digital technology (Pöntynen, 2022).

The Baltic Sea and its basin constitute an eco-region with limited water exchange that is experiencing effects of climate change such as rising temperatures, sea-level rise, and more frequent extreme weather events such as heatwaves, droughts, and floods. These pressures are anticipated to intensify, significantly impacting ecosystems and human activities, such as

infrastructure, agriculture, and tourism. Consequently, the region will need to adapt to these changes (BALTADAPT, 2013).

Temperatures are expected to rise during the 21st century, especially during winter months and in the north-eastern parts of the region, with cold extremes events likely to decrease while summer hot extremes expected to increase (Meier et al., 2022). These identified trends on land, together with increased oxygen deficiency, increased water temperature, changes in water salinity, and ocean acidification are expected to affect the marine ecosystem in various ways and may erode the resilience of the ecosystem (Meier et al., 2022), negatively affecting human activities depending on the sea.

The region is also facing significant pollution challenges, especially nutrient pollution (from land-based sources). Eutrophication caused by excessive nutrients, particularly from agriculture, has led to oxygen depletion and harmful algal blooms, threatening the health and biodiversity of the Baltic Sea (HELCOM, 2018). To decrease nutrient loads in the Baltic Sea and to mitigate eutrophication, various policies have been implemented, including the EU's Water Framework Directive, the Urban Wastewater Treatment Directive, the Nitrate Directive, and the Baltic Sea Action Plan (BALTADAPT, 2013; HELCOM, 2018). Although notable improvements have already been observed due to the Baltic Sea Action Plan, it will take some time before the full ecological effects of these policies can be accurately measured (HELCOM, 2018). This is because nutrients already accumulated in the water can take many years to fully cycle through the system and be processed; this particularly concerns the phosphorous found in the bottom sediments that under anaerobic conditions can be released to the water column again. The region is also facing challenges related to air pollution with shipping being an important source of emissions (mostly nitric oxide) as well as heating and industrial activities, which are present especially in urban areas of the region (ESPON, 2019). In addition, the sea is contaminated with persistent organic pollutants (POPs), heavy metals, microplastics, and other pollutants, affecting water quality and biodiversity, although their overall inputs appear to be decreasing (HELCOM, 2018).

Global transport has increased over the last decades and is expected to grow further in the Baltic Sea region (Baltic LINES, 2016). To reduce pollution associated with the shipping sector, the International Maritime Organisation (IMO) designed emission control areas in the Baltic Sea, which together with the EU' Sulphur Directive (Directive 2012/22/EU) is hoped to reduce emissions from shipping by 2050 (European Commission, 2022b).

Within the region, numerous species and habitats have been lost, and some are at risk of extinction (HELCOM, 2021). However, biodiversity is expected to improve in the upcoming decades because of recently implemented measures (e.g., the Baltic Sea Action Plan). On the other hand, some fish species such as cod are expected to decline and some species may become extinct, which is likely to affect the fishing industry (HELCOM, 2018). In the coming decades, commercial fishing is expected to stay at the current level while aquaculture and algae production are expected to grow due to the support from the EU Sustainable Blue Economy agenda, which should contribute to the achievement of the EGD (Pöntynen, 2022). Warming regional temperatures will result in a shorter ice-covered period that will potentially extend the trawling season while trawling areas for pelagic species will likely shift towards southern shallower areas (HELCOM, 2021). Recreational fishing in the Baltic Sea targets a diversity of species, with cod and salmon accounting for the largest number of landings (ICES, 2020).

Marine and coastal tourism is one of the main sectors expected to grow over the next 30 years (Pöntynen, 2022). Tourism is linked with policies in other sectors and is promoted by the EU’s Baltic Sea Region Strategy (Baltic Sea Region Strategy, 2021). However, coastal areas may suffer from even more frequent blooms of cyanobacteria posing health and image risks, ultimately impacting the tourism sector (HELCOM, 2021).

The EU’s Strategy on Offshore Renewable Energy aims to supply from offshore wind energy about 30% (300 GW) of the EU’s future electricity by 2050, with an intermediate target of 60 GW by 2030 (European Commission, 2020c). As a result, the Baltic Sea region will see growth in new offshore wind installations especially between 2026 and 2030 (Wind Europe, 2022). The Baltic Sea region is adapting to offshore wind energy through the expansions of port facilities and is aiming to contribute to the EGD’s goal of carbon neutrality by 2050 (Pöntynen, 2022).

Overall, the objectives and actions of the Baltic Sea Action Plan seek to align with the main European policies and the EGD. In addition, coherence among policies appear to be a priority as the HELCOM Ministerial meeting of 2018 agreed on the need to strengthen the Baltic Sea Action Plan and enhance policy coherence to deliver the Sustainable Development Goals (HELCOM, 2018).

Climate change	Pollution	Biodiversity	Shipping	Tourism	Energy	Fishing
Water temperature, water acidification and oxygen deficiency are expected to increase. Extreme events likely to increase.	Nutrient pollution from land-based sources and emissions from ships are expected to decrease.	Biodiversity is expected to improve due to the implemented measures, although some species might still decline.	Shipping is expected to increase but emissions from shipping are projected to see a reduction due to new measures (e.g., emission control areas).	Tourism is expected to grow over the next 30 years and is promoted by the EU’s Baltic Sea Region Strategy.	New offshore wind installations will take place, especially between 2026 and 2030.	Fishing is expected to stay at current levels, while aquaculture and algae production are expected to grow.

Table 5: Summary of main expected developments for each of the analysed topics for the Baltic Sea Region.

5.2. The Mediterranean Sea region

The Mediterranean Sea region includes a mix of EU Member States (such as Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia, and Spain) and a number of non-EU countries (Albania, Algeria, Bosnia and Herzegovina, Egypt, Israel, Lebanon, Libya, Montenegro, Morocco, North Macedonia, Serbia, Syria, Tunisia, and Turkey).

Numerous studies have examined the future of the Mediterranean Sea region, emphasising that the entire Mediterranean region (both on land and at sea) confronts various challenges, including population growth, urbanisation, climate change, water scarcity, pollution, unsustainable land and sea use practices, and the introduction of non-indigenous species. Most of these challenges are anticipated to worsen in the region over the next decades, particularly if global temperatures exceed 1.5 to 2°C above pre-industrial levels (MedECC, 2020; UNEP/MAP and Plan Bleu/RAC, 2020). Currently, over 512 million people reside in the states

bordering the Mediterranean Sea, a figure projected to increase by an additional 182 million by 2050, especially in the south and east of the basin (UNEP/MAP and Plan Bleu/RAC, 2020).

Although progress has been made in recent years regarding the implementation of sustainable development policies, many challenges remain, such as climate change, plastic pollution, sea level rise, and coastal erosion. Some regional assessments suggest that preventive measures should be prioritised alongside new regional models for development that consider environmental, social, and economic factors, and that facilitate cooperation between Mediterranean countries (UNEP/MAP and Plan Bleu/RAC, 2020; UNEP/MAP, 2022).

Climate change is identified as the primary threat to the Mediterranean Sea region. Surface temperature in the Mediterranean region is 1.5°C above preindustrial levels while the global average is + 1.1°C, and temperatures, along with their extremes, are predicted to increase by 2 to 3°C by 2050 with enormous consequences (UNEP/MAP and Plan Bleu, 2020). Precipitation is expected to decrease, with droughts likely to become more prevalent and generate non-productive zones (on land) by 2100. However, rainfall extremes will increase (Ali et al., 2022). These trends, coupled with the region's high vulnerability, are likely to negatively affect the main economic sectors in the region (e.g., decreased river flows and annual runoff will reduce hydropower capacity and yields of rainfed crops, which may decrease by more than 50% in some southern areas of the region) (Ali et al., 2022). As a result of climate change and population growth, increased numbers of urban populations within the region are likely to be exposed to severe droughts (UNEP/MAP and Plan Bleu/RAC, 2020).

Pollution is a transboundary and ubiquitous problem that strongly impacts the Mediterranean region (especially the health of its ecosystems and populations) due to demographic changes (e.g., population growth), and industrial and agricultural activities. The Mediterranean Sea is particularly polluted with substances such as plastic, emerging contaminants (e.g., POPs), heavy metals, and pathogens, which are all likely to increase in the next decades (MedECC, 2020). Waste generation per capita has also been increasing and is expected to continue in the future (50% increase by 2050) (EEA and UNEP/MAP, 2020). However, the recent (2020) EU Circular Economy Action Plan is expected to achieve some progress in the region towards waste prevention and improve recycling and recovery, contributing to the EGD's vision (WBCSD, 2020).

Regarding biodiversity in the Mediterranean region, a general decline in marine and land biodiversity is expected due to continued overfishing, warming, acidification, the spread of non-indigenous species, and demographic growth (MedECC, 2020). However, the implementation of sustainable fishing practices and increased biodiversity targets, such as protecting 30% of land and sea by 2030 as proposed by CBD and the EU's Biodiversity Strategy for 2030, could potentially help to mitigate these impacts (MedECC, 2020; European Commission, 2022). A warmer and drier climate in the region, combined with pressures from the fisheries sector and the increase of non-indigenous species, is changing the structure of ecosystems with unpredictable effects on goods and services provided (Colloca et al., 2017). This could potentially trigger the extinction of more than 20% of fish and marine invertebrates by 2050 (MedECC, 2020). Despite a decrease in fishing pressure over the past decade, two-thirds of commercial species are overfished, with the fishing activities at double that of estimated sustainable levels (FAO, 2022).

Tourism is a crucial sector in the Mediterranean region, generating significant economic value. However, an expected increase in severe climate events (e.g., wildfires, heatwaves, droughts,

and flooding) will likely influence tourists' choice of destinations and seasons (UNEP/MAP and Plan Bleu/RAC, 2020). Tourism activity peaks in summer, coinciding with the highest demand for water by irrigated agriculture, creating tensions that will likely be exacerbated in the future due to climate change (MedECC, 2020). Furthermore, coastal tourism activities might compete for space with other sectors such as fishing and emerging offshore energy. The anticipated growth of tourism in the region is likely to add pressure on local resources and contribute to an increase in maritime traffic (UNEP/MAP and Plan Bleu/RAC, 2020).

Cruise tourism could result in short-term pollution increases, as tourist vessels (e.g., cruise ships & ferries) are major sources of air pollution. However, the recent adoption of the IMO strategy for GHG emissions from ships holds potential for medium and long-term emission reduction within the region. However, the actual impact would largely depend on the effectiveness of the strategy's implementation (Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea, 2021). Although major shipping incidents have shown a sharp decreasing trend, operational pollution from ships persists in Mediterranean Sea waters, which could further increase as maritime traffic grows in the future (Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea, 2021). Maritime traffic and offshore oil and gas exploration and production represent key drivers of marine pollution in the basin. While offshore oil production is expected to decrease in the coming decades, more exploration plans are foreseen for the Mediterranean region (especially in Cyprus, Greece, and Malta) (European Commission, 2022b). Regarding plastic pollution, the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) states that marine litter pollution (waste discharged from shipping) is expected to decrease due to recent measures (MedECC, 2020). Furthermore, implementing policies and innovative technologies could reduce underwater noise pollution caused by the shipping sector (REMPEC, 2021).

Various studies predict an increase in energy demand, and while oil is projected to remain the dominant energy source until 2040 (MedECC, 2020), renewables are anticipated to account for 19-45% of the energy mix in the basin by 2050 (OME, 2021). Nevertheless, the increased use of fossil fuels will put further pressure on the climate. The energy system in the Mediterranean region requires a fundamental restructuring to achieve the necessary level of decarbonisation in line with the EGD targets. The overall energy mix is expected to diversify, with a growing emphasis on renewable energy (particularly wind and solar), while the share of hydrocarbon energy is projected to decline from 76% in 2018 to between 27-73% by 2050 (OME, 2021). Current policies are insufficient for the Mediterranean region to curb its energy demand and CO₂ emissions. The EGD serves as a reference model for neighbouring countries, but only a Euro-Mediterranean Green Deal, which would include all the Mediterranean bordering countries (EU and non-EU) could instigate the required change (OME, 2021).

In relation to the EGD, the Mediterranean region is a priority area for action due to its vulnerability to climate change impacts. The EC, in cooperation with the UNEP/MAP Barcelona Convention Secretariat and its protocols, has identified several actions to support the transition to a sustainable and carbon-neutral economy in the region, including investments in renewable energy, energy efficiency, sustainable transport, and biodiversity conservation. These topics are considered a priority in the UNEP/MAP Medium-Term Strategy 2022-2027 aiming to contribute to a “green recovery” in the Mediterranean region. Most studies indicate that the acceleration of climate change will likely cause a significant decline in biodiversity and a scarcity of natural resources (especially water) in the Mediterranean region. While numerous policies aimed at reducing climate change impacts and increasing adaptation have been introduced at the European level, there remains a lack of coherence in public action, with

many institutions operating in "silos." Consequently, Mediterranean countries need to establish more coherent policy and management frameworks to minimise risks and improve their resilience capacities (UNEP/MAP and Plan Bleu/RAC, 2020; Plan Bleu, 2022).

Climate change	Pollution	Biodiversity	Shipping	Tourism	Energy	Fishing
<p>Surface temperatures are expected to increase of 2 to 3C by 2050.</p> <p>Precipitations are likely to decrease which could decrease river flows, reducing hydropower capacity and generate non-productive zones by 2100.</p> <p>Extreme weather events are likely to increase.</p>	<p>Pollution is expected to increase.</p> <p>Waste generation per capita is expected to increase.</p> <p>Recent measures (e.g., the EU Circular Economy Action Plan) could reduce some of these impacts and achieve progress.</p>	<p>Biodiversity is expected to decline due to different human pressures.</p> <p>New measures (30% MPAs, sustainable fishing practices) are expected to reduce the decline.</p>	<p>Emissions from Ships are projected to reduce in the medium and long term, in line with the Green Deal.</p> <p>Plastic pollution from the shipping sector is expected to decrease.</p>	<p>Tourism is expected to be impacted by increasing severe climate events.</p> <p>Tensions with other sectors might exacerbate due to climate change.</p> <p>Pressures on local resources are likely to increase.</p>	<p>The overall energy mix is expected to diversify with a growth in the role of renewable energy, while current hydrocarbons energy is expected to decline.</p>	<p>Fishing might be impacted by the decline in biodiversity in the next decades although the establishment of MPAs and new sustainable fishing practices is projected to have a positive effect.</p>

Table 6: Summary of main expected developments for each of the analysed topics for the Mediterranean Sea Region.

5.3. The North Sea region

The North Sea region is dominated by EU Member States (Belgium, Denmark, France, Germany, and the Netherlands) with Norway and the United Kingdom being non-EU countries. The region and its catchment are home to approximately 184 million people and is one of the most disturbed marine areas globally (WWF, 2022). Over the next 30 years, the region is expected to undergo significant changes due to climate change, biodiversity loss, and pollution. These factors are interlinked and can have both direct and indirect impacts on the marine environment. Climate change is likely to reduce oxygen levels and water salinity in the North Sea and increase the water temperature by 2.5-3°C, which could negatively influence species and habitats (Hoerterer, 2017; MCCIP, 2020).

Based on different scenarios, the North Sea's marine biodiversity is expected to improve over the next few decades due to projected water quality improvements, the implementation of more sustainable practices related to human activities such as fishing and renewable energy production, and the potential establishment of new MPAs (PBL, 2018). The region is expected to see more intensive use over the next three decades by sectors such as shipping, sand extraction, defence, and activities like aquaculture and renewable energy production (PBL, 2018).

Initiatives are currently being mobilised to mitigate pollution in the North Sea region by 2050, with particular focus on diminishing emissions and air pollution. Much like in the Baltic Sea region, Emission Control Areas (ECAs) regulating of both sulphur oxides and nitrogen oxides

have been established in the North Sea through the IMO. When coupled with the EU Sulphur Directive, these measures are anticipated to significantly curtail such emissions from shipping by 2050 according to the European Commission (2022b).

In almost every future scenario, there will be less space for the fisheries sector due to wind energy ambitions, as well as potential consequences of a hard Brexit (PBL, 2018). Approximately 6,600 fishing vessels are active in the North Sea, although the total fishing effort has declined substantially since 2003 (ICES, 2022). In terms of catch weight, fish stocks harvested from the North Sea are being fished at levels consistent with achieving good environmental status (GES) under the EU's Marine Strategy Framework Directive; however, the reproductive capacity of the stocks has not generally reached this level. Given that nearly all North Sea fisheries catch multiple species, any regulation on the fishing of a particular species invariably influences the catch of others. Therefore, careful management is required to account for these complex ecological interactions (ICES, 2022). Projected declines in shellfish production resulting from ocean acidification may lead to significant economic losses for fisheries in the region. Fisheries will also be affected by increasing storms, although those projections are highly uncertain. Moreover, due to the increasing number of human activities at sea, less space is expected to be available for fishing activities (PBL, 2018), and by 2050, fisheries catches are likely to decrease by up to 30% compared to the 2000s levels (Pinnegar et al., 2020).

Tourism in the North Sea region has great potential for growth, and many marine spatial plans in the North Sea allocate space to this sector. As climate change leads to warmer temperatures, more favourable conditions along the coasts are expected, extending tourism seasons, increasing overall revenues, and employment (PBL, 2018). By 2050, the North Sea region is projected to experience positive changes in tourism due to climate change effects (Kreilkamp et al., 2016).

The North Sea basin is home to most of the current oil and gas production in the EU. However, there is also significant potential for various renewable energy sources. Wind energy is expected to further increase to decarbonise the region, as supported by the EU's Strategy on Offshore Renewable Energy (European Commission, 2022b). Other relevant activities expected to contribute to growth include technologies such as wave energy, tidal energy, thermal energy conversion, and micro-algae production (Martínez-Gordón et al., 2022). Within this context, it is likely that the North Sea region will transition away from oil and gas dominance, becoming a major hub for renewable energy production (World Energy Council, 2017). The North Sea, as part of the North-East Atlantic region, is affected by the recently launched OSPAR's strategy (the North-East Atlantic Environment Strategy), which aims to tackle the issues of climate change, pollution, and biodiversity (OSPAR, 2021) in line with the EGD.

Climate change	Pollution	Biodiversity	Shipping	Tourism	Energy	Fishing
Oxygen levels and water salinity are expected to decrease. Water temperature likely to increase of 2.5 to 3C.	Sulphur oxides and nitrogen oxides emissions from shipping are expected to decrease due to the new measures.	Biodiversity is projected to improve over the next decades due to the projected increase of nature areas, better water quality (as a result of new measures), and new less environmentally damaging techniques.	Shipping is expected to increase (especially due to tourism and offshore wind energy developments)	Tourism has potential to grow in the North Sea due to the expected increase in temperatures.	Large developments in offshore renewable energy are expected especially related to wind.	Shellfish production likely to be impacted by climate change resulting in economic losses for fisheries. Competition with other sectors likely to increase.

Table 7: Summary of main expected developments for each of the analysed topics for the North Sea Region.

6. Stakeholders’ perspectives on navigating the EGD

This section presents the synthesis and findings of the stakeholder interviews conducted as part of this back-casting exercise in an effort to co-identify possible steppingstones for progressing towards the EGD vision for 2050. The interviews aimed to gain insights into the complex array of policies that stakeholders navigate when seeking to achieve the EGD, including specific targets and objectives which are diverse and potentially conflicting. The findings are the result of in-depth conversations, shedding light on stakeholders’ understanding of the EGD, including the challenges they face when navigating its implementation as well as implications for achieving policy goals, today and in the future, considering regional challenges and priorities.

6.1 Stakeholder’s perception of the EGD

All interviewed stakeholders were aware of the EGD with some suggesting it has become a transformative framework to guide public policy making across Europe. Its inception resulted in a significant shift in the political landscape, boosting ambition towards carbon neutrality and fostering a circular economy. Despite this, stakeholders pointed out that the EGD’s transformative wave has not been uniformly visible across all sectors, highlighting the complexity of policies and regulations as well as the interlinkages between different sectors.

The interviewed stakeholders perceive the EGD mostly positively, as a new instrument to promote sustainable development that integrates various sectors and topics, such as offshore wind energy, transport, the food system, and a circular economy approach. Yet, this broad approach reveals how stakeholders operate within separate, often siloed, settings for decision-making leading to potential conflicts between stakeholder approaches and objectives, impeding the achievement of EGD’s goals. These potential conflicts of interest are best exemplified in the struggle between renewable energy production and biodiversity conservation. For instance, different interviewees pointed out how the pursuit of offshore wind energy targets sometimes comes into tension with marine conservation goals, suggesting a need for balanced, pragmatic decision-making. A key example highlighted by stakeholders was the sustainable use of marine

spaces, particularly as the intensified exploration for offshore wind energy threatens biodiversity within these regions.

One stakeholder recognised the EGD as ambitious and sustainability-focused, instigating a new level of systemic thinking. However, worries about potential greenwashing and the rapid roll-out of policies, leading to possible inconsistencies, were noted. The EGD's positive ambition was sometimes overshadowed by perceived shortcomings, such as a lack of comprehensive policies on natural resource extraction and an unbalanced emphasis on CO₂ reduction.

In a similar vein, stakeholders emphasised the intersection of regional strategies with the EGD's vision although some mentioned the need for better integration at national and regional levels. One such example was the Baltic Sea Action Plan, which emphasises nutrient-related issues and a transition towards organic farming, mirroring the EGD's own Farm to Fork strategy. This shared ambition is indicative of the EGD's influence in shaping regional instruments, fostering a level of political ambition towards the achievement of sustainable development.

However, the EGD, while offering an ambitious plan, also presents certain gaps. A noticeable omission identified by one of the stakeholders is the lack of a comprehensive policy effectively addressing natural resource extraction such as fish and minerals. The stakeholder pointed out how, for example, the fishing sector is regulated in a complex manner while there should be better policies regulating the sector to achieve the EGD's targets. Similarly, a stakeholder suggested that the EGD should more strongly emphasise ecosystem-based management as it is a key component in promoting a sustainable approach to managing natural resources.

Stakeholders also expressed concerns about the feasibility of achieving the EGD's targets, given perceived inconsistencies between some of the goals and challenges in policy implementation. For instance, facilitating increased mobility predominantly fuelled by oil conflicts with the objective of significantly reducing CO₂ emissions. Despite these challenges, the EGD is viewed as an influential framework in the work of stakeholders, particularly in areas such as nutrient mitigation, organic farming, MPAs, maritime transport.

One stakeholder mentioned how despite the challenges presented by crises like COVID-19 and the situation in Ukraine, the EGD maintained its status as a priority, demonstrating its resilience. However, the systemic changes bolstered by the EGD and the multitude of action plans have overwhelmed some stakeholders, causing a perceived disconnection from the initial ambition.

In the face of political shifts and future elections, there may be uncertainties surrounding the EGD's targets and ambitions. Nevertheless, the EGD's targets are largely recognised and accepted by the interviewed stakeholders. This serves to underscore the centrality of the EGD in policy efforts within the environmental sector and highlights its role as a transformative guide in the mission to address the interlinked climate, pollution, and biodiversity crises.

6.2 Policy implications and recommendations for achieving the EGD

A recurring theme from the interviews was the need for better policy coherence and cross-compliance to achieve the EGD's objectives. This was particularly highlighted in the context of offshore wind energy development and conservation, with stakeholders suggesting an improved permitting process and a deeper understanding of the environmental impacts of offshore wind turbines.

The interviewees suggested that the potential for realising the EGD's ambitious targets exists within the current policy framework, given efficient policy implementation, adequate funding, and sustained political will. At the same time, it is critical to focus more on the Just Transition mechanism and setting achievable interim steps towards 2050. Specifically, they highlighted the forthcoming Nature Restoration Law at the EU level as a promising initiative. Moreover, global initiatives such as the United Nations 2030 Agenda with its Sustainable Development Goals, and region-specific strategies like the Mediterranean Strategy for Sustainable Development (2016-2025) are also perceived as essential to achieve the EGD.

Despite general optimism, stakeholders expressed concerns about potential discrepancies between current policy trajectories and the EGD's aspirations. Among these concerns is the challenge posed by agricultural nutrient emissions in the Baltic region, particularly as it negatively impacts the nutrient balance. One stakeholder from the Baltic region suggested that this needs to be addressed through structural changes at the EU and national levels, particularly in the CAP.

Furthermore, cross-sectoral collaboration and processes are essential given the varied sectoral goals at play within the EGD. The need to break down silos in policy domains and foster dialogue and collaboration to find common ground was also highlighted by several stakeholders. This approach can help address challenges such as for example, balancing offshore wind energy targets with fishing interests. To improve policy implementation, interviewees suggested reorganising structures, incorporating more inter-species information and science, and updating legislation to ensure synergy across targets.

Two stakeholders pointed out that achieving the EGD's objectives does not require new policies but rather better implementation of current policies and perhaps a unified "Ocean Law" that encompasses all marine-related policies. The need to strengthen interfaces between science, policies, and societies was also emphasised, advocating for improved coordination between institutions and fostering cooperation among scientists. Another significant concern raised during the interviews was regarding the impending EU political elections and their potential repercussions on nature conservation and, by extension, the achievement of the EGD targets.

Through the interviews, it was also highlighted the need to strike a balance between economic growth and environmental sustainability. This was particularly evident in the challenges posed by the transition to cleaner energy sources. Ultimately, the interviews underscored the importance of policy coherence, effective implementation of existing policies, and cross-sectoral collaboration in achieving the objectives of the EGD.

6.3 Regional specificities and policy priorities to achieve the EGD

The interviewees generally highlighted the integral role regional specifics play in the implementation of the EGD. These regional differences present challenges, which are reflected in the respective policy priorities.

Some interviewees from the Baltic Sea region noted that targets set at the global level, such as those set by the CBD are not necessarily reflected in actions at the national or regional level, highlighting the existence of gaps within the Baltic region. They highlighted the need for the region to address nutrient-related issues especially from agriculture as eutrophication is the main cause of biodiversity loss in the Baltic Sea. Moreover, they foresaw a decrease in pollution from the shipping sector due to the recent measures focused on limiting emissions

from shipping as well as an increase in energy production, primarily from offshore wind farms. However, given the unique attributes of the Baltic Sea, they anticipated the recovery from nutrient inputs to be a long process, a conclusion also reflected in literature reviewed in this study.

For the Mediterranean Sea region, stakeholders believed that achieving the EGD's ambitious targets may be difficult given the current path, with some targets appearing incoherent. They emphasised the importance of considering the diversity and connectivity of protected areas, rather than merely focusing on the percentage of protected areas. One stakeholder voiced the anticipation of improvements in pollution and fishing but acknowledged that energy diversification and climate change remain significant challenges.

Another issue highlighted by one stakeholder regarding the Mediterranean region is the lack of responsibility regarding pollution in some communities (e.g., in non-EU states bordering the Mediterranean Sea), which can negatively affect the issue of pollution due to its transboundary nature. Furthermore, there are pronounced differences between Mediterranean countries in terms of national and regional visions, available resources, legislations, and understanding of the EGD. Considering these national differences, including resources and priorities, is critical when creating and implementing policies.

In the North Sea region, stakeholders discussed the lack of policy coherence in the permitting processes for offshore wind operations. They highlighted the need for improving the process, increasing knowledge about the environmental impact of offshore wind turbines, and fostering collaboration between developers. It was also suggested the possibility of combining wind farms with conservation objectives, as demonstrated by the experience at Sheringham Shoal, where the rocks around the turbines created artificial habitats for marine life, which could contribute to restore biodiversity and achieve the EGD's biodiversity targets.

6.4 Navigating towards the ambitions of the EGD

From the stakeholder interviews, it is clear that although the objectives of the EGD are widely supported, delivering transformative change by 2050 necessitates immediate, radical shifts in policy, practice, and societal outlook. One representative mentioned that some domains, notably freshwater and biodiversity, have struggled to align with the EGD, while the marine sector has gained political visibility. Looking ahead, resilience should be prioritised, with a greater emphasis on natural resources in the EGD's next phase. Adjustments to legislations like the Water Framework Directive could contribute to this evolution.

A Baltic region stakeholder mentioned the need for a structural shift in the CAP at both EU and national levels to meet the EGD's zero pollution target. Furthermore, it was noted that regional specifics, such as EU Member States vs non-EU countries participating in regional initiatives is a potentially important factor.

Stakeholders from the Mediterranean region emphasised the need for significant changes in consumption and transportation (both currently heavily reliant on oil) to achieve the EGD's targets. To reduce policy incoherence, one stakeholder proposed that different EU directorates (e.g., DG MARE and DG ENV) should be merged, while another stakeholder suggested that Member State ministries should also ensure consistency across their approach and objectives to promote a more coherent effort towards the EGD vision.

A representative from the Baltic region mentioned the EGD's long-term goals and regulations as a positive direction for the region. However, they highlighted that to realise these visions, enforcement mechanisms and country-wide compliance are necessary. While EU enforcement capabilities exist, compliance differs among countries, which does not facilitate policy implementation. Overcoming these challenges will need aligning national policies, fostering collaboration, and ensuring effective implementation. In contrast, a stakeholder from the Mediterranean region highlighted the existing conflicts and inconsistencies among policies but cautioned against using these as excuses for inaction. They argued for the need to implement existing policies and communicate with the EU institutions when coherence issues arise. They also suggested that increasing resources for selected ministries at the national level could accelerate policy implementation.

In conclusion, the interviews underlined the role of policy coherence, cross-sectoral collaboration, and addressing region-specific challenges in successfully implementing the EGD and also reinforced the need of societal transformation at all levels to meet the EGD's 2050 objectives.

7. Conclusions

The EGD is an ambitious vision which aims at enabling a just transition towards a more sustainable society for the EU and its Member States. Even though the ocean and maritime sectors do not predominately appear in the 2019 document, they play a key role in fostering this transition but, at the same time, they are deeply impacted by it.

The mapping exercise in sections 2 and 3 clearly shows the complex matrix of strategies and regulatory frameworks that are triggered by the EGD and that rotate around its many objectives and targets. The EGD inserts itself in an already busy and multi-layered regulatory and policy framework. Its concretisation raises then a series of challenges linked, in particular, to the interaction between strategies, objectives and targets. Cross-compliance and mechanisms that ensure levels of coherence are then necessary.

The mapping exercise also clearly shows how the three EGD streams (biodiversity conservation, climate change and zero pollution) are not equally treated in the relevant strategies and are not on the same footing in the existing legal framework. As highlighted in section 2.2.2, the objectives concerning pollution appear quite similar to the ones under the pre-existing EU policy framework and the EC's legislative proposals are primarily focused on strengthening the existing regulatory tools in this policy stream. Conversely, many innovations have been introduced and are under discussion within the climate change stream, raising several issues in particular concerning their impact biodiversity conservation and pollution reduction. We refer in particular to the development and increase of offshore renewable energy production. Many of these considerations find confirmation in stakeholders' opinion.

Based on the stakeholder interviews and analysis of the data, the following are identified “steppingstones” that could help to facilitate the achievement of the EGD's vision:

Policy coherence: Endeavour for improved coherence and cross-compliance between the diverse sectoral policies that contribute to the EGD. This can assist in addressing potential conflicts between objectives, such as between offshore wind energy development and marine conservation.

Improve policy implementation: Greater emphasis should be placed on the effective implementation of existing policies, rather than creating new ones. This includes improving sectoral regulations and enhancing processes (e.g., monitoring, enforcement, and compliance) for policy implementation.

Cross-sectoral collaboration: Encourage dialogue and collaboration between stakeholders (including private sector) in different policy domains to navigate potential conflicts of interest and find common ground to meet EGD objectives.

Address gaps in the EGD: Address the perceived gaps in the EGD, particularly within policies addressing natural resource extraction such as fish stocks.

Enhance the science-policy-society interface: Strengthen the links between science, policy, and society to ensure that decision-making is evidence-based (e.g., understanding the full environmental and societal impact of activities) and involves relevant stakeholders. This could include fostering better coordination between institutions and cooperation among scientists.

Account for regional specificities: Policy should reflect the unique challenges and opportunities of individual regions, such as the nutrient-related issues in the Baltic Sea region, and the unique environmental and socioeconomic contexts of the Mediterranean region. Especially important, will be to consider EU vs non-EU Member States within the regions, which will impact States and their ambitions towards the EGD.

Societal transformation: Beyond policy measures, achieving the EGD's objectives will require significant societal changes. This could involve shifting consumption patterns, adopting cleaner energy sources, and more.

Political will: The attainment of the EGD's objectives will require sustained political commitment, adequate funding, and enforcement of regulations at both EU and national levels.

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Annex

Annex 1. Interview guiding questions

Question block 1: The Green Deal

- Are you aware of the EU Green Deal? / What is it for you? / For what policy domains is the Green Deal?
- What are the main changes the Green Deal is bringing to public policy making in Europe? / For you professionally? For example:
 - o New political ambitions such as an increase in Marine Protected Areas
 - o New policy principles such as inclusiveness
 - o Other a change of mindset by officials

	EU GD vision	Ocean related targets
<p>Biodiversity</p> <p>“Preserving and restoring ecosystems and biodiversity”</p> <p>“Designing a fair, healthy and environmentally-friendly food system”</p>	<p>EU’s ambition is to reverse biodiversity loss and restore degraded ecosystems</p> <p>By 2030, on the path to recovery</p> <p>By 2050 all of the world’s ecosystems are restored, resilient, and adequately protected</p>	<p>By 2030:</p> <ul style="list-style-type: none"> - Legally protect a minimum of 30% of EU seas - Strict legal protection of 10% of the EU protected sea areas - Significant areas of degraded ecosystems are restored, habitats and species show no deterioration; 30% reach favourable conservation status / positive trend - Effectively manage all protected areas - Negative impacts on sensitive species and habitats are substantially reduced to achieve good environmental status - The by-catch of species is eliminated to allow for their conservation - 50% reduction to the number of Red List species threatened by invasive and alien species - Significant increase in organic aquaculture <p>By 2050:</p> <ul style="list-style-type: none"> - Biodiversity thrives and ecosystems/natural capital are protected, restored and valued in ways that enhance resilience to climate change and other environmental risks

<p>Climate Ambition</p> <p>“Increasing the EU’s climate ambition for 2030 and 2050”</p> <p>“Supplying clean, affordable and secure energy”</p> <p>“Accelerating the shift to sustainable and smart mobility”</p>	<p>Offshore renewable energy is a core component of Europe’s energy system</p> <p>The EU is climate resilient and adaptation is made smarter, more systemic and swifter</p> <p>Embrace clean, safe and connected mobility</p> <p>By 2050, reach climate neutrality (economy with net-zero GHG emissions) in line with the EU’s commitment to global climate action under the Paris Agreement</p>	<p>By 2030:</p> <ul style="list-style-type: none"> - 55% GHG emissions reduction – including removals compared to 1990 - All sectors under the revised EU ETS reduce GHG emissions by 61% compared to 2005 - Net sink of 310 million tons of CO2 - 60GW of offshore wind energy and at least 1GW of ocean energy - Produce up to 1 million tonnes of renewable hydrogen - Methane emissions decrease by 35% compared to 2005 - Coal, oil and gas consumption decrease, respectively, by 70%, 30% and 25% - 35% of non-CO2 GHG emission reduction compared to 2015 - First zero emission vessels in the EU market - Transport by inland waterways and short sea shipping increases by 25% <p>By 2050:</p> <ul style="list-style-type: none"> - climate neutrality - 300GW offshore wind energy and 40GW ocean energy - 90% reduction of GHG emissions from all modes of transport, including maritime transport - Transport by inland waterways and short sea shipping increases by 50%
<p>Zero pollution</p> <p>“A Zero pollution ambition for a toxic-free environment”</p>	<p>Slowing down all economic activities is not the way the EU envisions its own and the world’s path towards zero pollution.</p> <p>‘By 2050, air, water and soil pollution is reduced to levels no longer considered harmful to health and natural ecosystems and that respect the boundaries our planet can cope with, thus creating a toxic-free environment’.</p>	<p>By 2030:</p> <ul style="list-style-type: none"> - Reduce the number of premature deaths caused by air pollution by 55% - Reduce by 25% the EU ecosystems where air pollution threatens biodiversity - Target reduction of air emissions from international shipping by up to 80% SO2 and 20% NOx within ten years

		<ul style="list-style-type: none"> - Reduce all EU sales of antimicrobials for farmed animals and aquaculture by 50% - Achieve objectives and targets under the Single-Use Plastics Directive - Halve litter at sea (50% reduction of plastic litter and 30% of microplastics) - Reduce use and risk from chemical pesticides by 50% and no chemical pesticides are used in sensitive areas - Nutrient losses from fertilisers reduced by 50%, reduced use of fertilisers by 20% - Achieve targets under MSFD concerning plastic, underwater noise and contaminants - Set threshold value on beach litter (less than 20 litter items per 100 meters coastline)
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- Do you have any reflections on the ambitions and targets of the EU Green Deal?

Question block 2: Policies essential to achieving the EU Green Deal

- What existing policies do you consider essential for achieving the Green Deal ambition?
- Are any policies missing? What are they?

Question block 3: Regional policy priorities for achieving the ambition of the Green Deal

Show the summary of the regional visions - (Interview support 2) – see below

- Does the regional vision (see summary table below for the relevant region(s)) align with your view of the future?
- What specific challenges (e.g., environmental pressures) regarding the regional vision are essential to consider if progress towards the targets and objectives of the Green Deal vision is to be achieved?
- Considering these visions, is policy implementation in your region moving towards achieving the ambition of the Green Deal in the future? Your view? Yes/No? Why?
- What would you adapt, complement, modify to get closer to your understanding of the way public policies are going to be implemented in the future?

Question block 4: Moving closer to the ambition of the Green Deal

- Do you think the ambition of the Green Deal can be achieved? Yes/no – and why? What is missing, what challenges exist?
- What would help to overcome such challenges (i.e., close the gap between existing policy implementation and the Green Deal vision)?

- Strengthen policy design and implementation to ensure coherence and compliance (which policies in particular) – how?
- Enhance cross-compliance between policies (between which ones) - how?
- Adapt existing policies (which ones and how)?
- Develop new policies and instruments (why, with what focus)?
- Other suggestions

Question block 5: – Additional thoughts and ideas

- Do you have any additional thoughts and ideas to share in relation to what we discussed?

Annex 2. Interview support material

Summary of the Green Deal ambitions and targets – (Interview support 1) Missing from UU
Summary of the regional visions - (Interview support 2)

Summary of main expected developments for each of the analysed topic for the Baltic Sea Region.

Climate change	Pollution	Biodiversity	Shipping	Tourism	Energy	Fishing
<p>Temperature, water acidification and oxygen deficiency are expected to increase.</p> <p>Extreme events likely to increase.</p>	<p>Nutrient pollution from land-based sources and emissions from ships are expected to decrease.</p>	<p>Biodiversity is expected to improve due to the implemented measures, although some species might still decline.</p>	<p>Shipping is expected to increase but emissions from shipping are projected to see a reduction due to new measures (e.g., emission control areas).</p>	<p>Tourism is expected to grow over the next 30 years and is promoted by the EU's Baltic Sea Region Strategy.</p>	<p>New offshore wind installations will take place, especially between 2026 and 2030.</p>	<p>Fishing is expected to stay at current levels, while aquaculture and algae production are expected to grow.</p>

Summary of main expected developments for each of the analysed topic for the Mediterranean Sea Region.

Climate change	Pollution	Biodiversity	Shipping	Tourism	Energy	Fishing
<p>Temperatures are expected to increase of 2 to 3C by 2050.</p> <p>Precipitations are likely to decrease which could decrease river flows, reducing hydropower</p>	<p>Pollution is expected to increase.</p> <p>Waste generation per capita is expected to increase.</p> <p>Recent measures (e.g., the EU Circular Economy</p>	<p>Biodiversity is expected to decline due to different human pressures.</p> <p>New measures (30% MPAs, sustainable fishing practices)</p>	<p>Emissions from Ships are projected to reduce in the medium and long term, in line with the Green Deal.</p> <p>Plastic pollution</p>	<p>Tourism is expected to be impacted by increasing severe climate events.</p> <p>Tensions with other sectors might exacerbate</p>	<p>The overall energy mix is expected to diversify with a growth in the role of renewable energy, while current hydrocarbons energy is expected to decline.</p>	<p>Fishing might be impacted by the decline in biodiversity in the next decades although the establishment of MPAs and new sustainable fishing practices is</p>



<p>capacity and generate non-productive zones by 2100.</p> <p>Extreme weather events are likely to increase.</p>	<p>Action Plan) could reduce some of these impacts and achieve progress.</p>	<p>are expected to reduce the decline.</p>	<p>from the shipping sector is expected to decrease.</p>	<p>due to climate change.</p> <p>Pressures on local resources are likely to increase.</p>	<p>projected to have a positive effect.</p>
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Summary of main expected developments for each of the analysed topic for the North Sea Region.

Climate change	Pollution	Biodiversity	Shipping	Tourism	Energy	Fishing
<p>Oxygen levels and water salinity are expected to decrease.</p> <p>Water temperature likely to increase of 2.5 to 3C.</p>	<p>Emissions from shipping are expected to decrease due to the new measures.</p>	<p>Biodiversity is projected to improve over the next decades due to the projected increase of nature areas, better water quality (as a result of new measures), and new less environmentally damaging techniques.</p>	<p>Shipping is expected to increase (especially due to tourism and offshore wind energy developments).</p>	<p>Tourism has potential to grow in the North Sea due to the expected increase in temperatures.</p>	<p>Large developments in offshore renewable energy are expected especially related to wind.</p>	<p>Shellfish production likely to be impacted by climate change resulting in economic losses for fisheries.</p> <p>Competition with other sectors likely to increase.</p>