CrossGov

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

Deliverable 3.7

Cross-Compliance in policy integration

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Abstract	The report investigates how the main EU Green Deal ambitions in relation to zero pollution, marine biodiversity preservation and climate resilience are considered when implementing key agriculture, fisheries, aquaculture and renewable (offshore wind)

	energy policies. Building on the research carried out in 8 CrossGov case studies that applied the CrossGov Policy Coherence Assessment and Science-Policy-Society Interface (SPSI) Framework, it identifies key challenges as well as solutions that are expected to strengthen the integration of the EGD ambitions into sector policy implementation.
Keywords	Coherence, cross-compliance, case study, agriculture, fisheries, aquaculture, offshore wind energy, marine biodiversity, zero pollution, climate resilience, European Green Deal

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Acronyms

CAP	Common Agricultural Policy
CFP	Common Fisheries Policy
DoA	Description of Activities
EIA	Environmental Impact Assessment
EMFAF	European Maritime, Fisheries and Aquaculture Fund
EU	European Union
FLAG	Fisheries Local Action Group
FRA	Fishery Restricted Area
GFCM	General Fisheries Commission for the Mediterranean
GSA	GFCM geographical subarea
ICCAT	International Commission for the Conservation of Atlantic Tunas
MPA	Marine Protected Area
MS	(European Union) Member State
MSFD	Marine Strategy Framework Directive
MSPD	Maritime Spatial Planning Directive
MSY	Maximum Sustainable Yield
OWE	Offshore Wind Energy
WFD	Water Framework Directive
WP	Work Package

Executive Summary

The report investigates how the main EU Green Deal ambitions in relation to zero pollution, marine biodiversity preservation and climate resilience are considered when implementing key sector policies related to agriculture, fisheries and aquaculture and renewable (offshore wind) energy. It builds on the research carried out in 8 CrossGov case studies that applied the CrossGov Policy Coherence Assessment and Science-Policy-Society Interface (SPSI) Framework. These case studies covering a diversity of contexts and scales are: the Finnish Archipelago Sea; the Baltic Sea Basin; the Norwegian, Dutch and German North Sea; the Northern Adriatic Sea; the French Mediterranean Sea; and the Mediterranean Sea.

Three questions have been addressed:

- **Do policy instruments** [delivery mechanisms] set for the implementation of sectoral policies adequately **internalize key-requirements of EU policies established to deliver healthy marine ecosystems** (MSFD/WFD/MSPD)?
- **Do policy instruments** set for the implementation of sectoral policies adequately **internalize the three EGD objectives of focus in CrossGov**?
- What can be learnt from impediments and best practices to **facilitate the internalization of the key GD objectives into sectoral policies**?

The level of **internalization of the key requirements of EU policies** set to deliver healthy marine ecosystems varies among policies and sectors.

- For the **agricultural sector** in Finland, the latest national plan for implementing the CAP does take into account environmental requirements. However, it is unlikely the environmentally friendly practices it will support will be sufficient to achieve healthy marine ecosystems and comply with the WFD, MSFD, and MSPD requirements.
- With regards to **aquaculture and fisheries**, France and Italy have similar results. The current Italian European Maritime Fisheries & Aquaculture Fund considers biodiversity protection and the environmental objectives of the MSFD, but evidence collected shows that it is not sufficient to address pressures from fisheries. The current French fisheries national plan and European Maritime Fisheries & Aquaculture Fund considers biodiversity protection and the environmental objectives of the MSFD but evidence collected shows it is not in the first priorities. At the Mediterranean scale, although not directly connected to the MSFD obligations, the management of the tuna at the Mediterranean scale presents still all elements of a success story and is an inspiring experience for sustainable fisheries. More generally, more efforts on surveillance and the enforcement of biodiversity policies in the Mediterranean Sea will be required to strengthen coherence efforts made at the international and national levels.
- The **Offshore Wind Energy** (OWE) presents different pictures depending on countries. In Germany, Strategic Environmental Assessments (SEA) appear as rather effective in internalizing the requirements of the MSFD, the WFD, and the MSPD into sector's planning. In the Netherlands, improvements still exist in embedding environmental conditions directly into offshore wind permits in particular in relation to transparency and addressing cumulative and transboundary impacts of offshore wind farms on the marine

environment. In France, while the sector must comply in theory with the objectives of the MSFD and MSPD to be considered in SEA and Environmental Impact Assessments, the priority given to the quick development offshore wind energy might put some risks in how these obligations are applied, and there is room for improvement to internalize ecosystem protection in authorizations. A similar situation exists in the Baltic Sea Region where the existing policy framework and institutions do not adapt as fast as the rapid expansion of OWE with mechanisms to guide strategic decisions accounting for cumulative environmental impacts remaining underdeveloped.

Policy instruments set for the implementation of sectoral policies do internalize the **EGD objectives** to different extents. Concerning the **agricultural sector**, the Common Agriculture Policy is key to achieving marine ecological objectives. However, financing agri-environmental measures in the most problematic areas remains challenging. For aquaculture and fisheries, while pollution reduction and biodiversity protection are progressively given due consideration in aquaculture and fisheries strategies at different scales, limited attention is given to zero pollution and to climate change despite the significant public and political attention given to the latter. In general, however, the EGD is yet to become an explicit reference guiding the implementation of these policies, providing a very strategic ambition and direction that has not yet trickled down and is not yet translated into planning and implementation in particular at lower governance scales. For the **offshore wind energy** sector, building offshore wind energy farms has long-term positive impacts for climate change mitigation, but can contradict the biodiversity protection and zero pollution objectives if a strict framing of their activities is not put in place. While in Norway and the Netherlands, SEAs are identified as strong instruments to balance OWE developments with environmental and biodiversity objectives, SEAs in Germany refer to relevant EU environmental directives but do not fully internalise broader EGD objectives such as climate resilience, marine biodiversity protection and the sustainable blue economy. In general, as SEAs fail in many cases to consider cumulative and transboundary impacts, there are still improvements in how its application can account fully for the EGD goals. In France that is at an early stage of sector's development with most actions taken dedicated to the emergence of the sector, marine biodiversity conservation is rarely mentioned nor mainstreamed. But financial resources are currently allocated by authorities to fund scientific evidence on impacts on the marine environment and solutions for minimizing environmental impacts.

The research carried out identified several **solutions that could facilitate the internalization of the key EGD objectives into sectoral policies**. While all case studies stressed the relative tension that exist between economic development and ecosystem preservation, better integration is slowly being strengthened and implemented.

- **Best practices and elements to enhance the consideration given to the EGD ambitions** into sector policies include: setting transversal governance mechanisms as opposed to ecosystem management "in silos"; targeting financial resources to "priority areas"/hotspots; strengthening legal requirements to integrate biodiversity conservation into sectoral practices, as opposed to voluntary measures currently practiced which implementation depends on the good will of professionals or authorities; more explicit integration of ecological aspects into (integrated) permitting systems; enhancing data & knowledge transparency and accessibility, strengthening data-sharing mechanisms between

government agencies, developers, and researchers; setting biodiversity-related competition during tender procedures; developing and strengthening public and stakeholders deliberation/deliberative governance and collective processes crossing policy borders; strengthening SEA (enhancing procedural effectiveness by ensuring early and meaningful public engagement, improving transparency in processes, and strengthening the integration of outcomes into planning and decision-making processes), and more. Overall, institutional coordination needs to be strengthened at all scale and for all policy interfaces!

- In relation to **fisheries and aquaculture**, fisheries policies limit pressures on biodiversity through measures such as regulating fishing gear, establishing no-take zones, implementing temporal and spatial fishing restrictions, and contrasting illegal, unreported and unregulated fishing. Although the package of measures is rich, there is room to strengthen it with other science-based measures targeting biodiversity conservation accounting for the EGD biodiversity goals such as: extending the ban on trawling from 3 to 4 or 6 nautical miles (potentially on a seasonal basis); fostering the support for small-scale fishing operating with sustainable methods, enhancing the definition of co-management schemes for protected areas; improving the discussion on biodiversity-related topics in already-existing coordination fora; raising interest of fishers in biodiversity by involving them into biodiversity monitoring schemes; supporting the development of "restorating" and regenerating aquaculture and multiuse platforms. More transversally, the participation of sectoral stakeholders (including private operators) in the WFD, MSFD and MSPD policy processes could be strengthened enhancing awareness and ownership of the solutions proposed for the implementation of these directives. The persistent sectoral silos remain overall one of the main impediments towards more considerable progress: at the Mediterranean scale, for example, national fishery authorities will attend GFCM meetings, while their environmental counterparts will attend meetings of the Barcelona Convention with limited communication and connections between both. Thus, governance and knowledge sharing mechanisms need to be set or strengthened.
- Investigations on **OWE** stressed the lack of comprehensive and coordinated data regarding the long-term ecological impacts of large-scale offshore wind farms throughout the entire project lifetime. Overall, there is limited empirical knowledge about long-term effects on migratory species, benthic habitats or ecosystem functioning. And cumulative effects are rarely well known and considered. Thus authorizations are granted on the basis of limited scientific knowledge and partial assessments. As a result, the ecosystem-based approach required by the EGD and the MSFD remains challenging to implement. Also, there is potential for strengthening the alignment between offshore wind planning and integrated management frameworks by developing clear guidelines on the importance of valuable and vulnerable areas and the need to account for their protection in planning decisions. Supporting multi-use and nature-enhancement practices (including setting conditionalities in financing instruments to support such practices) presents also opportunities for integrating renewable energy and ecosystem restoration at the operational scale, facilitating discussions among stakeholders with different interests towards shared objectives. The development of unified roadmap and visions for specific seas to deliver "healthy and sustainable", providing high-level integration ensuring that climate and biodiversity goals are treated as joint, non-negotiable obligations, could also help strengthening the importance of integration in the MSPD spatial plans. Finally, integrating biodiversity

criteria into economic instruments, such as offshore wind auctions, could drive better environmental outcomes.

1. Introduction

CrossGov aims at enhancing knowledge on how coherence and cross-compliance of the marine-related policies of the European Union (EU) affect the ability to realize the European Green Deal (EGD) and Sustainable Blue Economy. Specifically, it assesses to what extent and in which manner policy coherence (in policy design and implementation) affects/facilitates cross-compliance with the EGD objectives related to zero pollution, marine biodiversity preservation and climate resilience [1]. Box 1 introduces the key concepts to be understood by the readers of this document.

Box 1: Key concepts and definitions part of the CrossGov project (D1.2 (2023) Policy Brief on coherent and cross-compliant Ocean Governance; D1.3 (2024) Policy Coherence Evaluation Framework; D4.2 (2025) Handbook on Policy Coherence))

Policy: Refers to a set of objectives, rules and measures that provide guidance for solving a particular societal issue. Within the CrossGov project, a *policy* can encompass substantive documents such as white papers and strategies as well as specific laws and regulations, or directives.

Policy area: Refers to a substantive group of policies that has formed around societal or sectoral interests. Examples of policy areas are environmental protection, trade, transport, waste, or renewable energy.

Policy coherence refers to how well different *policies* work together. It concerns the alignment and coordination of policies across different *policy areas* and governance levels to achieve mutually reinforcing outcomes and avoid that policy interventions contradict or undermine each other. Coherence can be defined as the extent to which policies strengthen each other by promoting synergies or reducing conflicts between objectives and measures both in design and implementation. Policy Coherence can be observed along two major axes: Horizontal and Vertical.

Horizontal coherence: refers to how well policies at the **same governance level** work together. It concerns the coherence between policies within the same *policy area* (e.g. between different EU water and wastewater policies), but also across different *policy areas* (e.g. between renewable energy and biodiversity policies). Horizontal coherence also describes policies that are cross-cutting though institutional and sectoral boundaries.

Vertical coherence: refers to how well policies are aligned **between different governance levels**. It concerns the alignment of policy interventions and plans across governance levels.

Cross-compliance specifically explores the cross-sectoral outcomes and impacts towards the EGD, the compliance with multiple strategies, objectives, goals, and targets in concert (progress towards one strategy does not negatively affect progress towards the objectives of other strategies, or even better, that actions support several strategies simultaneously). That is, effective design and implementation of policy instruments are required to deliver not only the individual policies' specified goals and targets, but also to support the achievement of other objectives under the EGD. Focus is on a subset of EGD objectives related to protection of marine biodiversity, climate resilience, and zero pollution. CrossGov works on the assumption that both horizontal and vertical coherence are important factors contributing to cross-compliance.

Ocean governance within CrossGov covers the entire policy landscape and its implementation that affects marine ecosystems, coupling marine with land-based policy and regulatory frameworks. It also refers to the formal and informal processes of collective decision-making, planning, deliberating, and capacity building by governmental, market, and civil society actors.

[1] This is just a "shorthand" that aims to cover -within those three areas - the several objectives which are relevant to the ocean (see D1.1 (2023) Green Deal Objectives and Scenarios)

Work Package (WP) 3 of CrossGov studies, by means of case study approach (D3.1[2]), the coherence and cross-compliance of the implementation of three framework EU Directives (namely: the Water Framework Directive (WFD), the Marine Strategy Framework Directive (MSFD) and the Marine Spatial Planning Directive (MSPD) (Task 3.2), as well as the internalization of three key EGD objectives (i.e. zero pollution, marine biodiversity preservation and climate resilience) into selected sector policies (Task 3.3). Task 3.2 and Task 3.3 complement each other: together, they help understand what the status of coherence across environmental and sector policies is, as well as interlinkages between those policies (when implemented) towards cross-compliance with the three EGD priorities considered. The key research questions that WP3 aims to address have been fine-tuned since the start of the CrossGov implementation. Table 1 presents questions that guide WP3 as presented in the Description of Action (DoA - left column) and how these questions have been operationalised with Task 3.2 and Task 3.3 lenses (middle and right columns). As it will be presented below, case studies have further translated these into specific questions adapted to their focus and context.

Table 1: Evolution of the CrossGov's WP3 questions through a Task 3.2 and a Task 3.3 lens.

Key research questions that WP3 aims to address (as stated in the DoA)	Explanations of the questions with a Task 3.2 lens	Explanations of the questions with a Task 3.3 lens
How do the plans and planning processes that implement marine related legal and policy frameworks support or impede progress towards the GD objectives? What explains the degree of vertical coherence towards the GD objectives?	Addresses both: Horizontal coherence (e.g., "how do the interlinkages between national and local plans developed under the WFD, MSFD, MSP provide an integrated approach to govern and protect the marine environment?"), and Vertical coherence (e.g., "to what extent does the resulting interplay between these three Directives' national and local plans assists the reaching of the three EGD objectives of focus in CrossGov?).	Addresses both: Do policy instruments [delivery mechanisms] set for the implementation of sectoral policies adequately internalize key-requirements of EU policies established to deliver healthy marine ecosystems (MSFD/WFD/MSPD)? and Do policy instruments set for the implementation of sectoral policies adequately internalize the three EGD objectives of focus in CrossGov?
What can be learnt from impediments and best practices, as reported in the first two questions, to facilitate the realisation of the key GD objectives?	Addressed by analysing the findings from the first two questions: For example: What is the takeaway? What needs to be done to facilitate the realisation of the three EGD objectives of focus? Which lessons can be distilled that can assist the coherence and cross-compliance of marine policies both for their own intended objectives, as well as for the three EGD objectives of focus?	What can be learnt from impediments and best practices to facilitate the internalization of the key GD objectives into sectoral policies?

[2] D3.1 (2023) (A framework for implementing case studies in CrossGov – internal report), is meant for case study leaders in the CrossGov project as a tool to refer to when carrying out the different stages of implementation of the case study work.

As Task 3.2 explores the coherence and cross-compliance of the three sets of planning systems from the three EU framework Directives Water Framework Directive (WFD), Marine Strategy Framework Directive (MSFD), and Marine Spatial Planning Directive (MSPD), Task 3.3 focuses on **how sectors (agriculture, fisheries, aquaculture, and Offshore Wind Energy (OWE)) internalise the environmental requirements from the three framework directives through policy instruments** (mainly impact assessments, funding conditionalities, environmental assessments or authorisations processes). The overarching research question that steers Task 3.3 research is: **how can climate resilience, zero pollution, and the protection of marine biodiversity best be internalized into sectoral decisions via their governance and delivery mechanisms?** Task 3.3 studies how these three key EGD objectives are or can be internalized (mainstreamed) into sector policies, and what opportunities and impediments exist for achieving this integration. The work developed as part of Task 3.3 is linked to other CrossGov's Tasks and WPs (Table 2). Figure 1 brings a graphical representation of the connections between WP2 and WP3.

Table 2: Linkages between WP3 and other Tasks and WP as part of the CrossGov project.

Linkages with WP1	Methodologies for the assessment of Policy Coherence (D1.3, rev Feb 2024) and for the assessment of Science-Policy-Society Interfaces in function of Coherence and Cross-compliance (D1.4, 2023) have been drafted and put to test with the Case Study work carried out in WP3. Both sets of methodologies were fine-tuned based on the experiences of implementing them as part of the WP3 work. The final version can be found respectively in *D4.2 (2025) Handbook on Policy Coherence*, and *D4.3 (2025) Blueprint for SPS*
Linkages with WP2	WP2 analysed and evaluated the multi-level policy landscape (EU, international, national) relevant to the Green Deal in the marine domain. Tasks 2.1 mapped the EU and international policy landscape (*D2.1 (2024) EU and international policy landscape*). Task 2.2 analysed the horizontal coherence in selected areas of the EU policy landscape (*D2.2 (2024) Horizontal coherence in EU law and policy*). Task 2.3 analysed the vertical coherence by focusing on the transposition into national policies in Norway, the Netherlands, Germany, and Finland (*D2.3 (2024) Vertical coherence in EU and national policies)*. Whenever relevant, the findings of D2.1 (EU and international policy landscape), D2.2 (Horizontal coherence in EU law and policy) and D2.3 (Vertical coherence in EU and national policies and laws) were directly integrated into case study results.
Linkages with WP4	Drawing on the information and experiences gathered in WP2 and WP3, three Roadmaps addressing offshore wind energy, agriculture pollution, and fisheries were co-created in collaboration with key stakeholders from each sector (*D4.1 (2025) Policy coherence roadmaps*).
Linkages with WP5	WP3 case study results, as part of the products from WP4, are shared with all interested parties (decision-makers, stakeholders, students and young professionals) through the means of communicating synthesis, workshops, webinars (see for example News and Events) and the CrossGov MOOC.

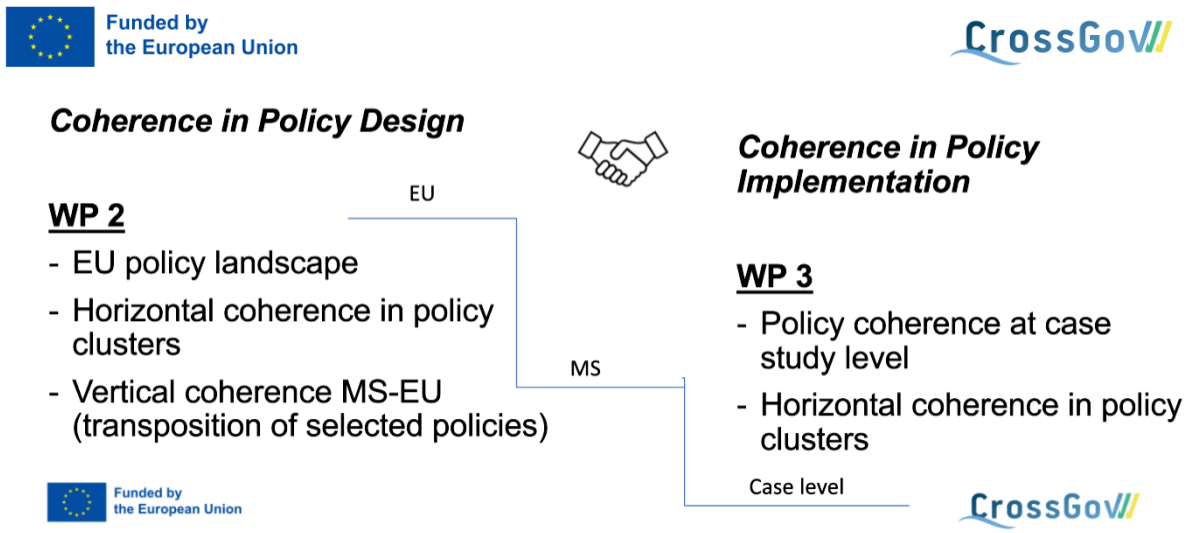

Figure 1: Graphical representation of the connections between WP2 and WP3 as part of the CrossGov project.

Deliverable 3.7 documents the results of case study work developed in CrossGov. D3.7 is the gate to more detailed information contained in internal reports developed for each individual WP3 case study (namely: Step1, Step 2 and Step 3 - See Annexes 1 to 3 for the templates of these internal reports). These reports can be found online on dedicated case study webpages of the CrossGov website[3], with basic information and key results of these reports presented in Chater 3 & Chapter 4 below.

[3] Crossgov.eu/case-studies/

1.1 A bird's-eye view of Task 3.3 sectors

Three main sectors are the focus of Task 3.3 case studies (Figure 2):

- Agriculture, through the analysis of the EU Common Agricultural Policy (CAP);
- Aquaculture and fisheries, through the analysis of the EU Common Fisheries Policy (CFP) and regional sea fisheries policies;
- Offshore wind energy and strategies supporting its development at different scales.

Figure 2: The 7 Task 3.3 CrossGov case studies investigating cross-compliance in policy integration

Agriculture

Agriculture in the EU is a vital sector, both economically and socially, and is primarily governed by the Common Agricultural Policy (CAP). The CAP aims to ensure food security, support farmers' incomes, and promote rural development, while increasingly integrating environmental and sustainability objectives. Recent reforms, particularly those adopted in 2023–2025, have sought to simplify CAP implementation and reduce administrative burdens, but have also sparked debate over the weakening of environmental requirements and long-term policy coherence. The CAP's measures aiming at protecting the environment include, among others, cross-compliance, which links financial support to environmental standards. However, recent changes have made several environmental requirements voluntary rather than mandatory, and exemptions for smaller farms have reduced oversight. These shifts have led to concerns among environmental groups that the CAP is falling short in supporting biodiversity and sustainable farming practices, with reports of poorly designed and underfunded eco-

schemes. A significant challenge for EU agriculture is its impact on the marine environment and marine biodiversity. Agricultural runoff, especially nutrients and pesticides, contributes to water pollution and eutrophication in rivers and coastal waters, threatening marine habitats and species. While the CAP includes buffer strip requirements and measures to reduce pollution, the recent relaxation of environmental standards may undermine efforts to protect marine ecosystems. The ongoing tension between simplifying agricultural policy and achieving ambitious environmental goals remains a central issue for the future of EU agriculture and its relationship with the marine environment.

Aquaculture and fisheries

Aquaculture and fisheries in the EU are primarily governed by the Common Fisheries Policy (CFP), which underwent significant reform in 2013 to integrate environmental, economic, and social dimensions for sustainable management. The CFP aims to ensure fish stock management at maximum sustainable yield, based on scientific advice, with multiannual plans for different sea basins. In 2023, the European Commission presented a comprehensive package to improve sustainability, including measures to protect marine ecosystems and promote energy transition away from fossil fuels. The European Maritime, Fisheries and Aquaculture Fund (EMFAF) is the main financial instrument supporting these policies from 2021 to 2027, with a budget of over €6 billion (its predecessor, the European Maritime and Fisheries Fund (EMFF), operated from 2014 to 2020). Despite these policies, both sectors face significant challenges including climate change impacts, the need for clean energy transition, strict environmental regulations, bureaucratic hurdles, and consumer perception issues. Currently, only 41% of fish stocks in the North-East Atlantic and Baltic Seas and 9% in the Mediterranean and Black Seas are in good biological condition, highlighting the urgent need for more effective management.

Offshore wind energy

The EU aims to drastically expand offshore renewable energy, primarily wind, to meet its climate goals of a 55% emissions reduction by 2030 and climate neutrality by 2050. Current offshore wind capacity of 12 GW is targeted to reach 60 GW by 2030 and 300 GW by 2050, alongside ocean energy development.[4] The realization of these offshore wind energy (OWE) targets requires, among other things, strong cooperation between states and a focused approach to specific challenges. Key issues that demand particular attention include grid infrastructure development, coexistence with other sea uses, and ensuring resilient supply chains.[5] On the other hand, it can be noted that different EU sea basins may have varying priorities regarding which challenges require the most focus in each maritime area (e.g., challenges related to eutrophication are more prominent in the Baltic Sea compared to other EU sea basins). Above all, the successful realisation of OWE targets requires balancing the various uses of the sea and the benefits derived from them while maintaining and, to the extent necessary, restoring a healthy marine environment.

[4] COM(2020) 741 final., Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future.
[5] Ibid.

1.2 The European Green Deal

The three pillars of the EGD (namely: zero pollution, marine biodiversity preservation, and climate resilience) and their associated policies have been extensively discussed in D1.1 "*Scoping: Concretising the policy targets and developing key scenarios*" and are presented in a summarized way in Table 3 below.

Table 3: The 4 key components of the EGD's marine-related initiatives identified in D1.1.

EU Biodiversity Strategy for 2030	It 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. To that end, the EC has adopted the Nature Restoration Law, which aims at halting biodiversity loss and at the same time tackling the climate crisis. The Biodiversity Strategy calls for increased financial support for nature-based solutions. It also promotes measures to support sustainable fisheries and aquaculture, calling for the use of ecosystem-based approach to fisheries management**.** 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	It 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 **WFD** and the **MSFD**, 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. It is complemented by the EU Chemicals Strategy for Sustainability in 2030, which addresses the release of chemicals.
EU Climate Adaptation Strategy	It highlights the role of the ocean for climate change resilience. Particularly, 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. 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 emphasizes the importance of protecting and restoring marine ecosystems as a way of increasing their resilience to climate change impacts. 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.
EU Offshore Renewable Energy Strategy	It 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 decarbonization 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 organizations, and other stakeholders in the planning and decision-making process.

1.3 Task 3.3 research questions

To better understand how sectoral policies integrate objectives from key-EU marine directives and the marine-related pillars of the EGD, three research questions were selected to guide research carried out in case studies (Table 4).

Table 4: Task 3.3 research questions. The EGD objectives cited refer to the 3 pillars above mentioned tackling marine biodiversity, climate resilience and zero pollution.

	Research question	**Explanation**
Horizontal coherence	Do policy instruments set for the implementation of sectoral policies adequately internalize key-requirements of EU policies established to deliver healthy marine ecosystems (MSFD/WFD/MSPD)?	This question is about understanding how sectoral policies and their related delivery mechanisms have been modified/developed to be coherent with the requirements of key EU policies related to the management and protection of marine ecosystems.
Vertical coherence	Do policy instruments set for the implementation of sectoral policies adequately internalize the EGD objectives?	This question is about understanding how sectoral policies and their related delivery mechanisms have been modified/developed to be coherent with the requirements of the EGD and its marine-related pillars.
Impediments and best practices	What can be learnt from impediments and best practices to facilitate the internalization of the key EGD objectives into sectoral policies?	Whether they are case study-specific or transversal, impediments and best practices observed throughout Europe will feed the discussion on how best to strengthen policy coherence and integrate the EU marine directives and the EGD into sectors.

2. Research design

Eight case studies of WP3 have investigated Task 3.3 research questions. The case studies addressing Task 3.3 research questions focus on four main sectors (agriculture, fisheries & aquaculture, offshore wind energy). For each of these sectors, the internalization of the objectives of three framework directives for managing marine ecosystems (namely, the WFD, the MSFD and the MSPD) and of the three pillars of the EGD (zero pollution, climate resilience, marine biodiversity protection) is investigated, as summarized in the Table 5 below.

Table 5: Which Task 3.3 case study tackles which sectors and which EGD policy.

Case Study	Sectors addressed				EU Green Deal Objectives addressed			
	Agriculture	Fisheries	Aquaculture	Offshore wind energy	Zero pollution	Climate resilience	Marine biodiversity	Sustainable blue economy*
Finnish Archipelago Sea	x		x		x		x	
Baltic Sea Basin				x			x	
Norwegian North Sea				x				
Dutch North Sea				*x*			*x*	
German North Sea				x		x	x	x
Northern Adriatic Sea		x	x				x	
French Mediterranean		x		x			x	
Mediterranean Sea		x				x	x	

** Sustainable blue economy is another EGD objective studied independently by one case study only. It is integrated in this overview-table but is not central in this report's analyses.*

It should be noted that the final sectors and EGD policies tackled by case studies have evolved since the beginning of the case study work (January 2023). The first research phase carried out in case studies has indeed framed the scope of their research and when relevant, adapted or narrowed their focus as compared to initial ambitions stated in the DoA.

2.1 Data collection: methods and location

Different methods were applied to collect data and information in Task 3.3 case studies, building *inter alia* on the internal CrossGov report entitled "*Operational guidance for stakeholder mobilisation and co-building in CrossGov*". Guided by the questions included in the (WP1) assessment frameworks, primary empirical material was collected by means of literature review (peer reviewed journal manuscripts and grey literature) and stakeholder involvement (semi-structured interviews, participatory observation in events, workshop organisation). This process contributed to the CrossGov co-creation process involving stakeholders relevant to case study areas. Salient features of the data collection process of each case study are presented in Table 6.

Table 6: Synthesis of data collection on Task 3.3 case studies

Case study	Responsible partner	Literature review	Stakeholder involvement	Other
Finnish Archipelago	UEF	X	Two individual interviews	
Baltic Sea Basin	UEF	X	One individual interview carried out	
Norwegian North Sea	NIVA	X	5 individual interviews carried out	
Dutch North Sea	UU	X	3 individual interviews	
German North Sea	RIFS	X	9 (online) individual interviews conducted	
French Mediterranean	ACTeon	X	12 individual interviews one co-created workshop co-organised with a key-regional stakeholder (online, 18/04/2024)	Participatory observation during the offshore webinar cycle of "La mer en débat" (6 webinars from November 2023 to March 2024)
Mediterranean Sea	ACTeon	X	14 individual interviews	Participatory observation during the Fish Forum (19-23/02/2024, Antalya, Turkey)
Northern Adriatic Sea	CNR-ISMAR	X	4 individual interviews conducted, 2 questionnaires shared in May 2024	

Documents analysed included national and regional level-policy documents related to the sectors of interest to the case study. Stakeholder involvement included individual and collective interviews, "ground-truthing" of the results produced on case studies by stakeholders themselves, as well as workshops of different format. The type and format of stakeholder involvement organised on case studies was left up to each one of them, to ensure that it would be as relevant as possible, depending on the national/regional/local context, opportunities and challenges. The information collected was synthesized, analysed and presented in three documents that capture the research process carried out in each case study (Step1 report, Step 2 report, and Step 3 report, presented in Table 7 below (and available in Annex 1: Step 1 report template, Annex 2: Step 2 report template and Annex 3: Step 3 report template of this report).

Table 7: The three Step reports used by Task 3.3 to document the collected data

Step 1 report	
	Prepares the case study research design by giving a brief contextual description of the case study; describes the specific problem at focus, specifies the research objectives, and presents a preliminary list of documents to analyse and actors to include in stakeholder events.
Step 2 report	
	Assesses, within the relevant case study area, the current state of play in coherence and cross-compliance and the implications for policy outcomes. Brings the results from applying the two assessment frameworks presented in the following section.
Step 3 report	
	Answers WP3 and case-study specific research questions; summarises other findings (if any); draws conclusions from the cases including areas for improvement

The information has been under an evolving level of analysis throughout the Task 3.3 work (see Figure 3), moving from the Step 2 report (documenting the results from the two assessment frameworks) into the Step 3 report (answering the Task 3.3 research questions), and finally into the cross-analyses presented in this report. The information presented in D3.7 is an aggregated and synthetised analysis of the results obtained from applying the two CrossGov frameworks (see below) into individual case studies.

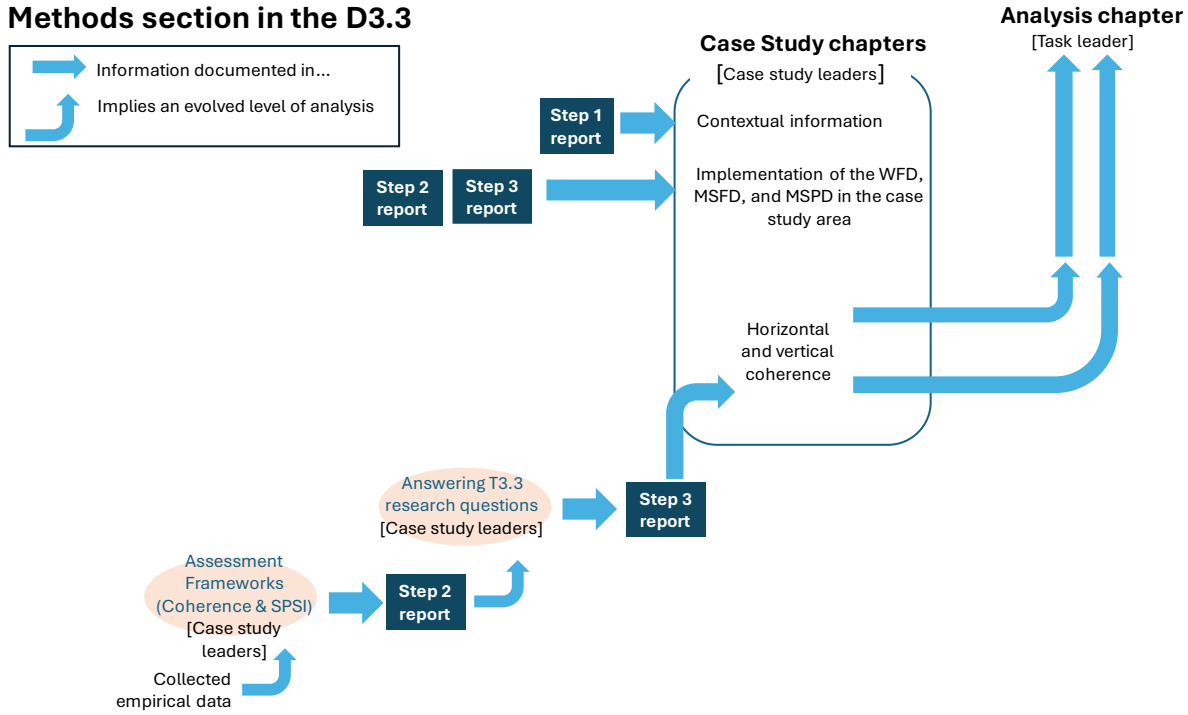

Figure 3: Relationship between the information documented in the Step reports and how it fed the respective sections of this Deliverable. Ovals represent a processing of the information, and straight arrows represent where the information has been documented.

2.2 Frameworks mobilised for the analysis

Two analytical frameworks guided the case study research: the Policy Coherence Evaluation Framework (D1.3 rev. Feb 2024) and the Science Policy Society Interface assessment framework (D1.4 Oct 2023).

The CrossGov **Policy Coherence Framework** allows to understand where in the policy cycle (design and/or implementation) or at which governance level (EU, national, sub-national) problems or challenges of coherence emerge. This methodological approach explores it is based on two components:

1. Two coherence attributes (**policy objectives** and **policy measures**) which are relevant for influencing the degree of coherence in policy design and implementation, and three explanatory variables (**governmental structures**, **science-policy-society interfaces**, and **stakeholder involvement**) that help explain the extent of coherence (Figure 4);
2. *Guiding questions* to support the assessment of why there is (in-) coherence; they provide a common structure for the evaluation of policies from different perspectives

(see Annex 4: The guiding questions that support the coherence assessment (D1.3 rev Feb 2024). for the detailed list).

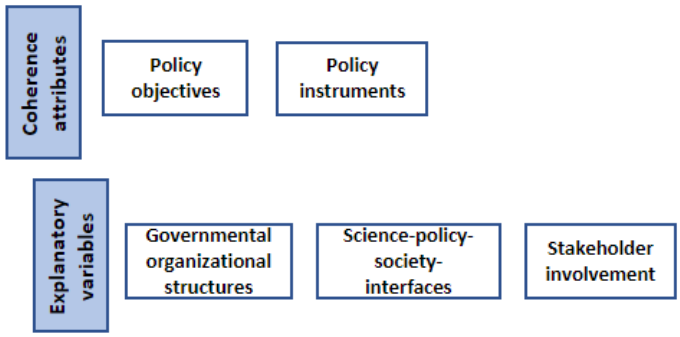

Figure 4: The two coherence attributes and the three explanatory variables part of CrossGov's Policy Coherence Framework (D1.3 rev Feb 2024).

Not all attributes and variables are equally relevant to all case studies. Similarly, case studies have been able to adjust guiding questions to make them fit-for-purpose to their policy, governance, and case study focus, scale and context.

The **CrossGov Science-Policy-Society Interface** (SPSI) **Assessment Framework** is structured into **six** Building Blocks identified as the main elements of SPSI potentially relevant to EGD-related marine legislation and policies. These include: Data & knowledge; Assessments; Models of scientific policy advice and knowledge transfer mechanisms; Permanent SPSI platforms; Competence framework for researchers and policymakers; and, Funding & resources. While all Blocks can in theory contribute to the analysis, tasks in WP2 and WP3 can select the Blocks that are most relevant for them, depending on policies under analysis, geographical domain, relevance in the policy cycle, research questions of main interest. To support this selection, Figure 5 shows how each Building Block is expected to contribute differently to the four SPSI-related research questions.

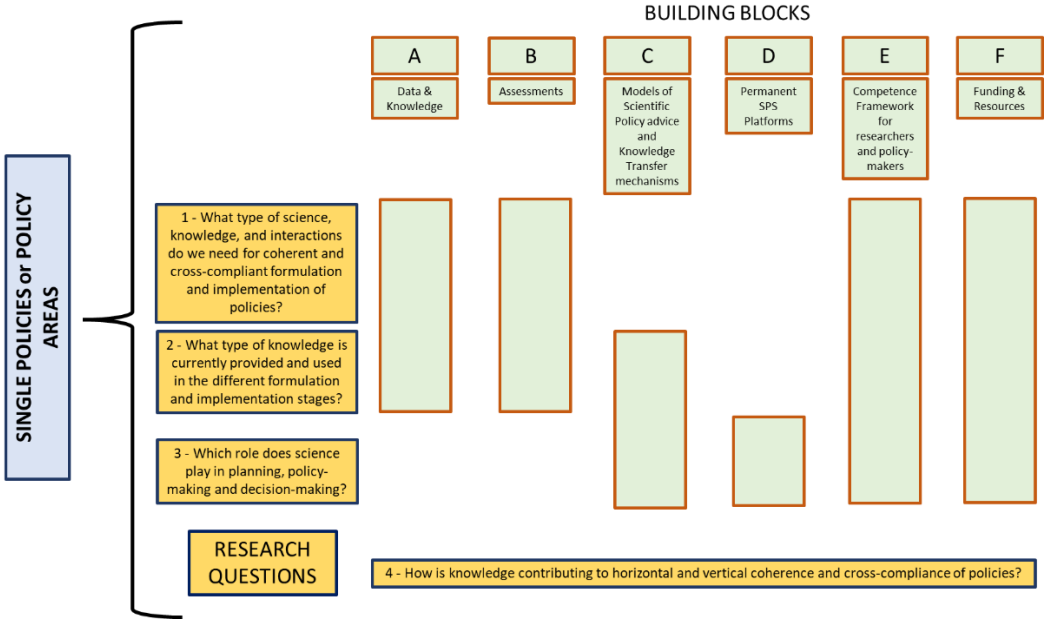

Figure 5: Connection between policies, research questions and Building Blocks (source: D1.4, Nov 2023)

The step-by-step operational procedure for SPSI analysis is structured in four steps:

- Step 1 – Defining the policy and geographical scope of the analysis and identifying data and information sources.
- Step 2 - Defining the Science-Policy-Society system under analysis.
- Step 3 – Characterizing the Building Blocks of SPSI to answer the research questions.
- Step 4 – Synthesis: answering the research questions.

The SPSI framework is the further elaboration of one of the explanatory variables of the Coherence Framework. Both frameworks have been aligned, with the guiding questions of the Coherence framework for the SPSI explanatory variable being the main questions of each building blocks proposed in the SPSI framework.

Results of the research carried out in each case study included in the Step 2 template for SPSI should be seen as a synthesis of the work undertaken on SPSI. The extended responses on the SPSI analysis, collected by means of the Excel template[6], were included as annex to this Step 2 report with a narrative following the suggested SPSI structure (See Annex 2 for details).

2.3 The guiding principles of the case study work

When answering Task 3.3 and case-study specific research questions, case study leaders have been following a series of objectives and principles. Listed in the DoA of the project and reproduced below in Table 8, they ensure that case study work and answers to the research questions are taking into account relevant stakeholder's feedback.

Table 8: The guiding principles of case study work.

Ensuring co-creation	Co-creation should be at the centre of stakeholder involvement in case studies and take place throughout the process, from framing the case study to co-identifying the best solutions to strengthen policy coherences
Addressing the local scale	Case study work should pay attention to the local and social dimensions of policy (in)coherence. Whenever relevant, local communities should be involved
Connecting with social innovations	Whenever it is relevant and possible, case study work should identify and connect with social innovation/bottom-up initiatives
Connecting T3.2 and T3.3	3 case studies (Finnish Archipelago Sea, French Mediterranean and Northern Adriatic Sea) are involved in both tasks 3.2 and 3.3. Connecting whenever relevant the findings from T3.2 and T3.3 should be ensured by case study leaders.
Investigating the funding mechanisms supporting policy implementation	Case study work should investigate the funding mechanisms supporting policy implementation (e.g. the funding associated to programmes of measures, plans of actions)
Investigating implementation measures	Case study work should ensure the study on 1-2 implementation measures to illustrate how coherent/incoherent policies translate in the implementation phase

[6] The Excel file is to be considered a tool to gather and structure information on the analysis of building blocks. There is no need to submit the Excel pages. The important part is that case studies leaders use the information/knowledge gather through the Excel file (or other means) to develop the narrative of the 4 SPSI-steps (and step 3 in particular) to be included in the annex.

2.4 Browsing through D3.7 - A note to the reader

D3.7 presents synthetised information for each of the 8 Task 3.3 case studies, based on the internal reports written under WP3 during the duration of the CrossGov project. Each case study focuses on a specific geographical scope, sector and EGD pillar. Within this global framing, case studies each narrowed down the scope of their investigation, in order to ensure answering research questions with detailed, case-specific answers (as opposed to generic answers). For these reasons, withing each European sea and sector discussed, the information presented below spans a wide range of topics.

In addition to answering Task 3.3 research questions on the sectoral and geographical level, D3.7 also provides a glimpse of the detailed results produced by case studies. To access the full results produced by case studies, the reader is invited to consult their webpages on www.crossgov.eu/case-studies/. More synthesised versions of case study results can be found on these same case study webpages (communicating syntheses, summary reports), but also in WP3 policy briefs and WP4 sectoral roadmaps (covering agriculture, fisheries and OWE), all available as well on www.crossgov.eu/deliverables/.

3. Background information on case studies

This chapter presents the salient features of the WP3 case studies relevant to Task 3.3. More elaborated descriptions of individual case studies are found in Step 1 reports. The information presented here feeds on D2.1, D2.2 and D2.3.

3.1 The Finnish Archipelago Sea

The Archipelago Sea is a part of the Baltic Sea located southwest of Finland in the southernmost part of Finnish territorial waters. The Archipelago Sea lies between the Gulf of Bothnia, the Gulf of Finland, and the Åland Islands (Figure 6). Together with Åland Archipelago, it consists of about 40,000 islands (Kunttu et al., 2019). The sea area is shallow and fragmented, making it vulnerable to nutrient loads from anthropogenic sources. HELCOM has listed the Archipelago Sea as an Agricultural Hot Spot in the Baltic Sea, making it the only remaining Hot Spot in continental Finland (Bonsdorff et al., 1997; Leppäkoski et al., 1999; HELCOM, 1993; Westberg et al., 2022). The catchment basin consists of nine river basins that run through agricultural areas, mainly with clay soil.

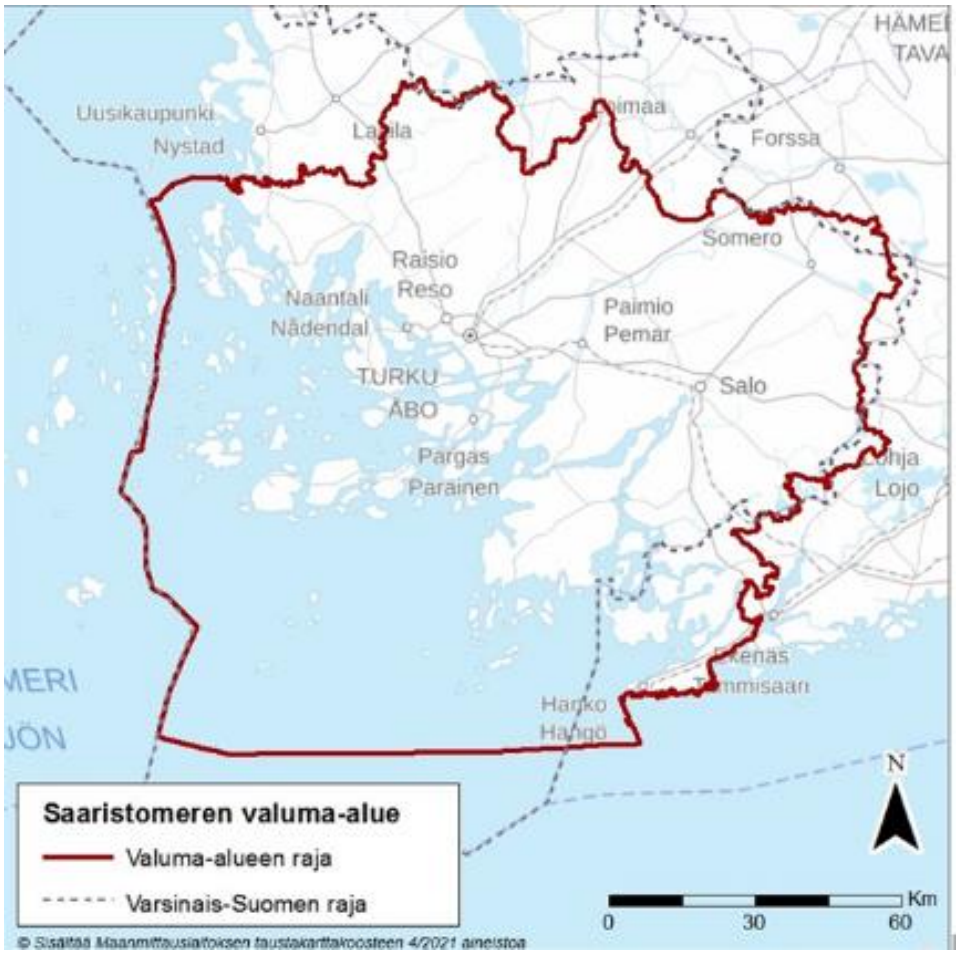

Figure 6: Geographical scope of the Finnish Archipelago case study (Southwest Finland ELY Centre, www.ely-keskus.fi/saaristomeri)

Finland is an EU Member State and therefore the Archipelago Sea is covered by the WFD, the MSFD and the MSPD, as well as their respective planning systems. The geographical scope of the River Basin Management Plans (RBMP), the Marine Strategy (MaS), and the Maritime

Spatial Plan (MSP) partly overlap in Finland, as they all cover coastal waters according to the Finnish legislation. In practice, the entire Archipelago Sea is covered by all these plans, as the large number of islands results in a wide coverage of coastal waters in the area. According to the RBMP, the ecological status of the Archipelago Sea is less than good. Most of the water bodies have a moderate status, but some have a poor or even bad ecological status.

The main challenge in Archipelago Sea is eutrophication. Speaking of Finnish maritime condition, the distinction must be made between **point source pollution** (which has somewhat declined) and **non-point source pollution** (which is the key problem seen from the point of view of eutrophication). The bulk of Archipelago Sea's nutrient loading originates mostly from non-point source pollution, although there are also some significant instigators of point source pollution.[7] The main issue seems to be the lack of efficient tools to manage riverine load from agriculture.

Although **agriculture is the major source of nutrient pollution**, there are several other sectors which cause eutrophication. The Finnish marine management plan includes measures to reduce eutrophication for following sectors: urban wastewater treatment, aquaculture, agriculture, industry, peat production, forestry, rural settlements, road transport, maritime transport, boating, and stormwaters. The sectors identified in the river basin management measure plan are urban and rural settlements, industry and mining, aquaculture, peat production, forestry, agriculture, and acid sulphate soils, and hydraulic engineering.

3.2 The Baltic Sea

The Baltic Sea region has significant potential for OWE (Figure 7). The eight countries bordering the sea have committed to increasing capacity to 19.6 GW by 2030, and plan to consider a 2040 target.[8] The total potential capacity of offshore wind sites in the Baltic Sea is estimated to be over 93 GW.[9] A challenge to reach these objectives is that in the Baltic Sea region, there are numerous stakeholders, including several countries and regional umbrella organizations, such as VASAB (the intergovernmental multilateral co-operation of the Baltic Sea Region in spatial planning and development) and HELCOM (the Baltic Marine Environment Protection Commission) operating at different governance levels (international, regional, and local). The Baltic Sea also serves multiple purposes and provides various benefits that must be reconciled (examples of such uses and benefits include aquaculture, shipping, tourism, and, on the other hand, biodiversity).

[7] The Archipelago Sea Hot Spot Road Map Project: Road map of water protection in agriculture p. 14.
[8] https://windeurope.org/newsroom/press-releases/baltic-sea-countries-sign-declaration-for-more-cooperation-in-offshore-wind/
[9] Ibid; and The Marienborg Declaration 2022. Available at: [https://www.regeringen.dk/aktuelt/tidligere-publikationer/the-marienborg-declaration/] .

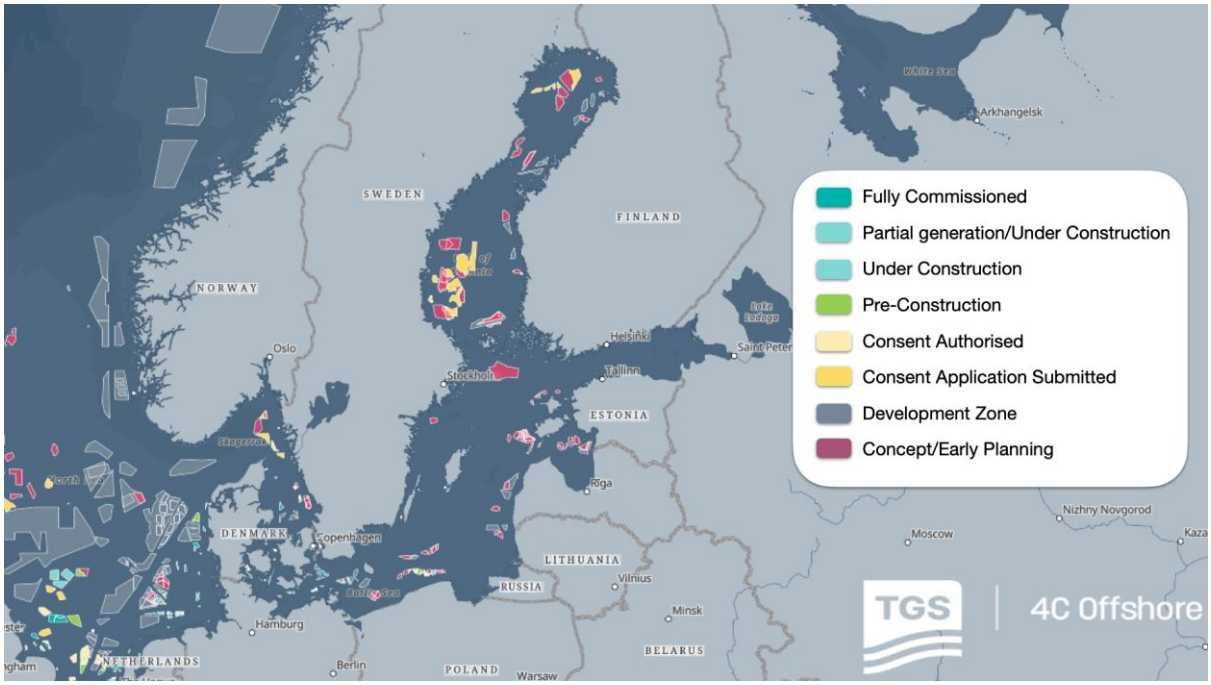

Figure 7: Offshore wind farms in the Baltic Sea, as of May 2025 (source: https://www.4coffshore.com/offshorewind/)

This case study presents an analysis of OWE developments in the Baltic Sea, with a focus on the perspectives of HELCOM and VASAB. The analysis focuses particularly on the planning process of OWE in the Baltic Sea Region, and how it could be made more coherent in relation to marine biodiversity and aquaculture. Special attention is given to OWE, aquaculture, and biodiversity. By analyzing the overall development and planning of OWE in the Baltic Sea, it is possible to identify situations where increased coherence and cross-compliance are required. This ensures that OWE and, by extension, the goals of the EGD can be promoted as effectively as possible while taking into account other uses and benefits of the Baltic Sea, such as biodiversity and aquaculture.

Currently, the governance framework for OWE in the Baltic Sea is generally well-organised, albeit fragmented in nature. Cooperation and harmonisation have however not been central in OWE planning until recently. For example, the working group HELCOM-VASAB on MSP (HELCOM-VASAB MSP WG), launched in 2010, bring together practitioners and stakeholders to discuss cross-border and cross-sectoral issues and has focused on ensuring cooperation among the Baltic Sea Region countries for coherent regional MSP processes. Still, historically, Baltic Sea Region organisations have not focused on creating harmonised OWE planning programs or guidelines. Moreover, the rapid development of OWE has only become widespread in roughly the past decade or so [10][11].

Likewise, different areas of the Baltic Sea have historically approached OWE planning in distinct ways, with varying levels of policy integration. Still to this day, planning criteria vary significantly across the Baltic Sea.[12] Some countries emphasize wind speed and economic

[10] Baltic LINes 2019, Offshore Wind and Grid in the Baltic Sea – Status and Outlook until 2050, p. 17.
[11] Baltic LINes 2019, Identification of transnational Planning Criteria, p. 27.
[12] Ibid, at p. 35.

efficiency, while others prioritise environmental considerations, such as avoiding Natura 2000 sites (e.g. Finland and Lithuania) or maintaining minimum distances from shore (e.g. Latvia, Sweden, and Poland) to mitigate visual and ecological impacts.[13] These differences in planning approaches are a part-reason for cross-border challenges, underscoring the need for more harmonised planning processes.

Our findings reveal that planning systems' weaknesses are related to guidance and implementation. The overall Baltic Sea planning framework includes several non-binding guidance documents, such as the ecosystem approach implementation guidance[14], guidelines on transboundary MSP output data structure[15] and the guidelines for transboundary consultations, public participation and co-operation.[16] These guidelines are voluntary in nature, and the first two (concerning the ecosystem-based approach and data structures) are presently under revision by HELCOM/VASAB. However, there is a lack of guidance for certain topics, such as the implementation of strategic environmental impact assessments and cumulative impact assessments, for which no clear guidance has been developed regarding their practical application. The implementation of cumulative impact assessments for OWE in the Baltic Sea faces challenges due to the lack of information on impacts and the fact that existing assessment methodologies focus on evaluating past impacts rather than screening for future impacts. To enhance coherence, cumulative impact assessments should be further developed on the Baltic Sea and should be transboundary.

Practical actions, such as the development of platforms like BASEMAPS,[17] which facilitate transnational data sharing, illustrate the move toward a more integrated regional strategy. Similarly, Baltic LINes' common guidelines for OWE[18] and WWF's recommendations[19] aim to balance renewable energy expansion with environmental and maritime spatial planning considerations. These recommendations align with the broader energy objectives of the EGD and the REPowerEU initiative, while also taking into account aquaculture and biodiversity.

Finally, we identified that the lack of unified planning criteria for OWE and the lack of stakeholder collaboration in the Baltic Sea are a challenge. Moreover, we further identified that the rapid pace of technological innovation in OWE (such as advances in turbine size, foundation depth, and capacity density) intensifies pressure on MSP processes to adapt and to reconcile these developments with the aforementioned issues.[20] There is no unified intergovernmental cooperation body for offshore wind power in the Baltic Sea region, which means that OWE is not a structured field of action, such as shipping for instance.[21] The creation of such a new organisation has be considered as one potential solution to policy coherence

[13] Ibid.
[14] https://helcom.fi/wp-content/uploads/2019/08/Guideline-for-the-implementation-of-ecosystem-based-approach-in-MSP-in-the-Baltic-Sea-area_June-2016.pdf]
[15] https://vasab.org/wp-content/uploads/2019/04/Guidelines-on-transboundary-MSP-output-data-structure-ADOPTEDbyVASAB__HELCOM.pdf
[16] https://helcom.fi/wp-content/uploads/2024/08/Guidelines-on-transboundary-consultations-public-participation-and-co-operation-_June-2016.pdf
[17] https://basemaps.helcom.fi/
[18] https://vasab.org/wp-content/uploads/2019/05/Baltic_LINes_recommendations.pdf
[19] https://wwfbalticprogramme.cdn.triggerfish.cloud/uploads/2023/04/21175502/ORE-go-to-areas_21APRIL2023.pdf
[20] Baltic LINes 2019, A Practical Guide to the Designation of Energy Infrastructure in Maritime Spatial Planning – Work Package 4.4, p. 4.
[21] Baltic LINes 2019, Identification of transnational Planning Criteria, p. 35.

challenges.[22] As an alternative to establishing an entirely new organisation, it could be proposed that existing organisations, such as HELCOM or VASAB, assume a guiding role in the development of offshore wind power on a Baltic Sea-wide scale. This would help avoid unnecessary administrative burdens or needlessly large organisational frameworks.

3.3 The Norwegian North Sea

Figure 8: Identified areas for offshore wind (NVE 2023)

Norway is a latecomer regarding offshore wind energy production. In 2022, however, the government has set a high target for offshore wind development stating that by 2040, 30GW of offshore wind energy should be allocated. In an initial round starting around 2009, Norwegian authorities identified fifteen potential areas for offshore wind developmentFigure. By 2022, two of these areas—Utsira North and Southern North Sea II—were officially opened for offshore wind energy production (Knol-Kauffman et al. 2023) and in March 2024 the first tender was completed for Southern North Sea II. Apart from the mentioned areas, the former fifteen areas are discontinued, and currently, twenty new areas are subject to a Strategic Environmental Assessment (SEA) (Figure 8). Three of these areas are prioritized for a licensing round in 2025 (Sørvest F, Vestavind B, and Vestavind F) and their SEAs should be finished by the end of November 2024. Following the strategic assessments, the Ministry of Energy will decide which areas can be opened for offshore wind energy development.

This case study provides a Norwegian perspective on the reconciliation of biodiversity and environmental objectives with offshore energy production to meet climate objectives. The **objective** of this case study is **to understand how Norway incorporates biodiversity and environmental objectives into the planning processes toward offshore wind energy production.**

Norway's approach to offshore wind energy development is guided by several key policies that aim to balance energy production with environmental conservation. The **Offshore Energy Act** and its associated regulations are the cornerstone of Norway's offshore wind energy

[22] Baltic LINes 2019, Recommendations to the HELCOM-VASAB MSP working group on future actions deriving from findings from the Baltic LINes project, p. 8.

governance. **The Climate Action Plan for 2021-2030** sets ambitious targets for reducing greenhouse gas emissions and transitioning to renewable energy sources. Complementing this is **White Paper 36 (2020-2021)**, which outlines Norway's long-term **energy strategy**, emphasizing value creation, electrification, and the development of new industries. The **Nature Diversity Act** mandates that all activities must consider their impact on biodiversity, emphasizing the precautionary principle and ecosystem-based management. Additionally, **integrated management plans** aim to ensure the sustainable use of marine resources while maintaining ecosystem health.

3.4 The German North Sea

The EGD seeks to make Europe the first climate-neutral continent by 2050. It outlines broad objectives across multiple policy domains, including renewable energy, biodiversity, the circular economy, climate action, zero pollution, and sustainable food systems (European Commission, 2019). Among its key priorities is the acceleration of renewable energy deployment to reduce carbon emissions and meet climate targets.

In line with these ambitions, offshore wind energy development in the North Sea is undergoing a significant expansion as Germany and other EU Member States strive to meet renewable energy targets and accelerate the transition to a low-carbon economy (Hainsch et al., 2020). This expansion is driven by the need to meet both national and EU renewable energy targets, while also contributing to the climate goals of the EGD. To support this growth and achieve the targets of the Renewable Energy Directive (RED III) (Directive 2023/2413), Germany has updated the Offshore Wind Energy Act (WindSeeG) in 2023[1], setting ambitious targets for increasing offshore wind capacity to at least 30 GW by 2030, 40 GW by 2035, and 70 GW by 2045 (WindSeeG, 2024).

While offshore wind energy is essential for reducing carbon emissions and thus mitigating climate change, its rapid expansion raises significant concerns for marine biodiversity (Stephenson, 2021). Offshore wind farms can disrupt marine habitats, displace species, and interfere with migratory routes (Li et al., 2023). Additionally, these effects can accumulate, especially when multiple wind farms are situated close to each other, though the long-term cumulative impacts remain largely unknown (Stephenson, 2021; Watson et al., 2024).

This calls into question biodiversity targets, such as the goal to protect 30% of the EU's sea area (10% strictly protected), including through ecological corridors, as prescribed by the EU Biodiversity Strategy 2030 (European Commission, 2020b). These goals align with the Nature Restoration Law's targets and reinforce conservation objectives under the Birds and Habitats directives, which focus on the conservation and protection of biodiversity within the EU (Directive 2009/147/EC & Directive 92/43/EEC) as well as the MSFD, which aims to achieve Good Environmental Status (GES) in EU marine waters (Directive 2008/56/EC).

An important regulatory tool that integrates environmental aspects into offshore wind energy planning and potentially contributes to achieving this balance is Strategic Environmental Assessments (SEA). Mandated in the EU by the SEA Directive, SEAs are used to evaluate the environmental impacts of certain plans and programs early in the decision-making process (Directive 2001/42/EC). Complementing SEAs, Environmental Impact Assessments (EIA)

mandated through the EIA Directive mandates detailed environmental assessments for specific projects, including offshore wind farms (Directive 2014/52/EU). Both SEAs and EIAs are important instruments as they help to ensure that renewable energy, and other projects, do not negatively impact biodiversity and align with biodiversity goals. The planning and development of offshore wind farms are also governed by the MSPD, which mandates that Member States develop MSP to balance various maritime activities and ensure environmental protection (Directive 2014/89/EU).

In Germany, the SEA and EIA directives are transposed into national law through the Environmental Impact Assessment Act (UVPG), requiring authorities to assess environmental impacts of programmes and plans such as the planning of offshore wind farms (Bundesministerium der Justiz., 1990; Rehhausen, 2019). SEAs, in particular, are conducted at the planning stage, helping to evaluate cumulative environmental pressures, transboundary impacts, and possible management alternatives (BMUV, no date; Pinkau & Schiele, 2021; Kusters et al., 2024). However, the application of SEAs in marine areas and in MSP, particularly regarding transboundary effects, cumulative pressures, and the integration of environmental corridors/barriers, is still evolving. Several studies have criticised the effectiveness of SEAs in these areas, noting gaps in implementation and practice (Geißler et al., 2019; Rehhausen A. 2019; Pinkau & Schiele, 2021).

Achieving a balance between climate action – through offshore wind energy – and marine biodiversity conservation highlights the need for policy coherence. Within the CrossGov project, policy coherence refers to the extent to which diverse policies work together by promoting synergies and reducing conflicts between their objectives (Platjouw et al., 2023). In this case, **ensuring that renewable energy projects do not undermine marine biodiversity targets requires a careful consideration of potential trade-offs**. For example, coherent policies could create opportunities for synergy, where offshore wind farms, if designed with nature-positive design, could provide new habitats and possibly enhance biodiversity in the North Sea (Ter Hofstede et al., 2022; Kingma et al., 2024).

This case study explores the balance between biodiversity conservation targets and the expansion of offshore renewable energy within Germany's Exclusive Economic Zone (EEZ) in the North Sea (Figure 9), including the role of SEAs and other cross-cutting policy tools.

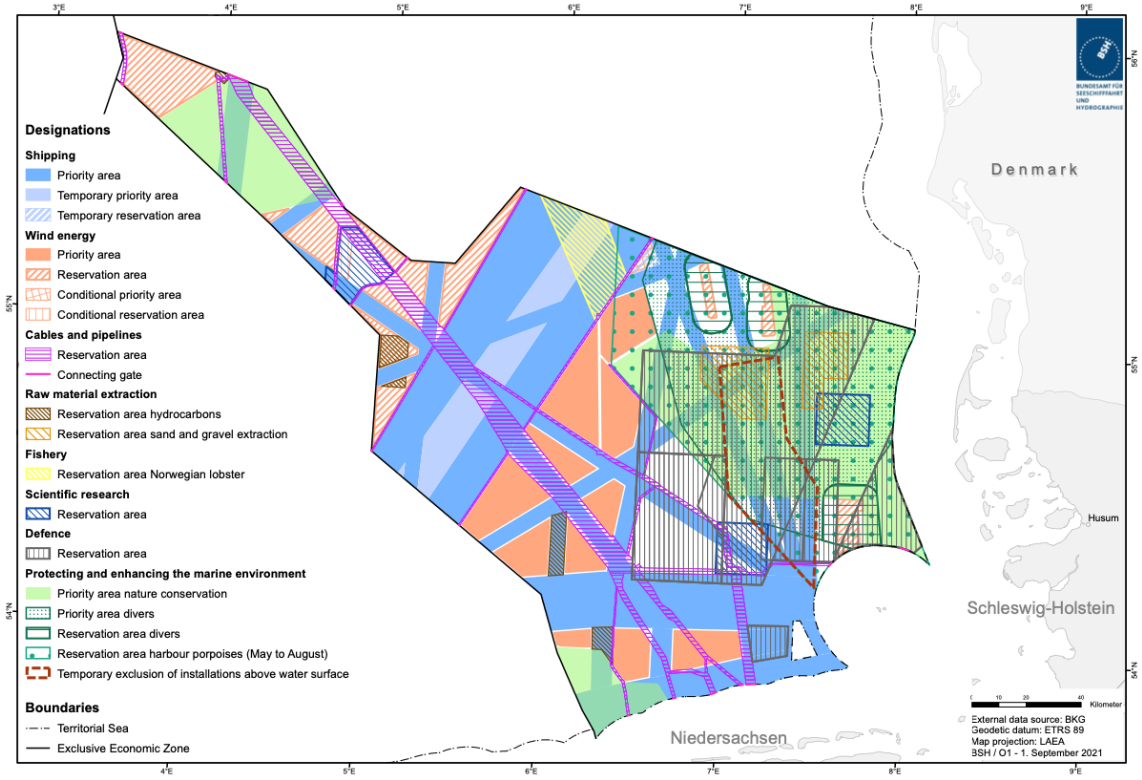

Figure 9: 2021 Maritime Spatial Plan for the German exclusive economic zone in the North Sea (BSH, 2021).

It aims at understanding the application and implementation of policies in Germany and how they support or hinder the balance between renewable energy expansion targets and biodiversity conservation goals, contributing to policy coherence towards the EGD objectives for 2030 and 2050.

3.5 The Dutch North Sea

The North Sea is both a highly valuable and significantly vulnerable ecosystem, connected to the Northeast Atlantic Ocean System. For decades, it has been one of the most intensively used seas in the world, particularly by industries such as shipping, fishing, oil and gas production, sand extraction, and more recently, wind energy exploitation. These activities have dramatically transformed the North Sea, and its ecosystem is currently facing further change and becomes central to three major transitions: energy, food and nature conservation.

Historically, the North Sea has been of immense economic value to the Netherlands, contributing around 25 billion euros annually, which translates to roughly 4 percent of the gross national product.[23] As such, it is no surprise that the vision for the North Sea in 2050 anticipates an intensification of its use, albeit in new forms.[24] Ships will continue to sail to and from ports, but fishing practices will evolve, the number of oil and gas installations will decline and wind farms, along with other renewable energy infrastructure, storage and conversion facilities, will proliferate. Alongside this industrial transformation, the goal is to restore the North Sea ecosystem leveraging innovative, multifunctional uses of space to ensure the sustainable intensification of exploitation activities.

[23] North Sea Programme 2022-2027, 22.
[24] *Ibid,* 23.

Key to this vision is the combination of wind farms with other forms of marine uses, such as aquaculture, sustainable fishing practices, nature restoration and enhancement (like the creation of oyster banks), solar and tidal energy, as well as energy storage solutions, including hydrogen and CO2 injection into depleted gas fields. This synergetic approach is envisaged to harmonize the energy, food and nature transitions, ensuring that economic activity does not come at the cost of North Sea's ecological integrity but instead respects its carrying capacity.[25]

The already fragile balance struck between the existing uses of the North Sea appears to be jeopardized by the projected proliferation of offshore wind parks.[26] The unprecedented expansion of offshore wind energy is primarily driven by the EU and international climate commitments of the Netherlands, as further fleshed out with the EGD and its implementation instruments. Specifically, the rolling out of offshore windfarms is partly due to the increased commitment of the Netherlands under its Climate Act in 2019 to reduce GHG emissions to a level that will be 95 percent lower in 2050 than in 1990. The tightening of the EU climate targets with the adoption of the Climate Law and the Package for 55 series of instruments further clarifies the key role offshore wind is expected to play in the energy transition. In that context, the North Sea, often referred to as a "green powerhouse", holds enormous potential for contributing to these climate targets. The Netherlands has already set and keeps upscaling its ambitious goals for offshore wind capacity: the revised Roadmap for Offshore Wind Energy 2032 expects that offshore wind farms will reach 21GW of installed capacity, while plans for 2040 and 2050 aim to scale up to 50GW and 70GW, respectively. This exponential increase of capacity is accompanied by the designation of new offshore wind locations as outlined in the North Sea Programme 2022-2027 (Figure 10):

[25] *Ibid,* 27-28.
[26] Offshore Windenergy Roadmap 21 GW (April 2024), see also: https://english.rvo.nl/news/new-planning-offshore-wind-energy

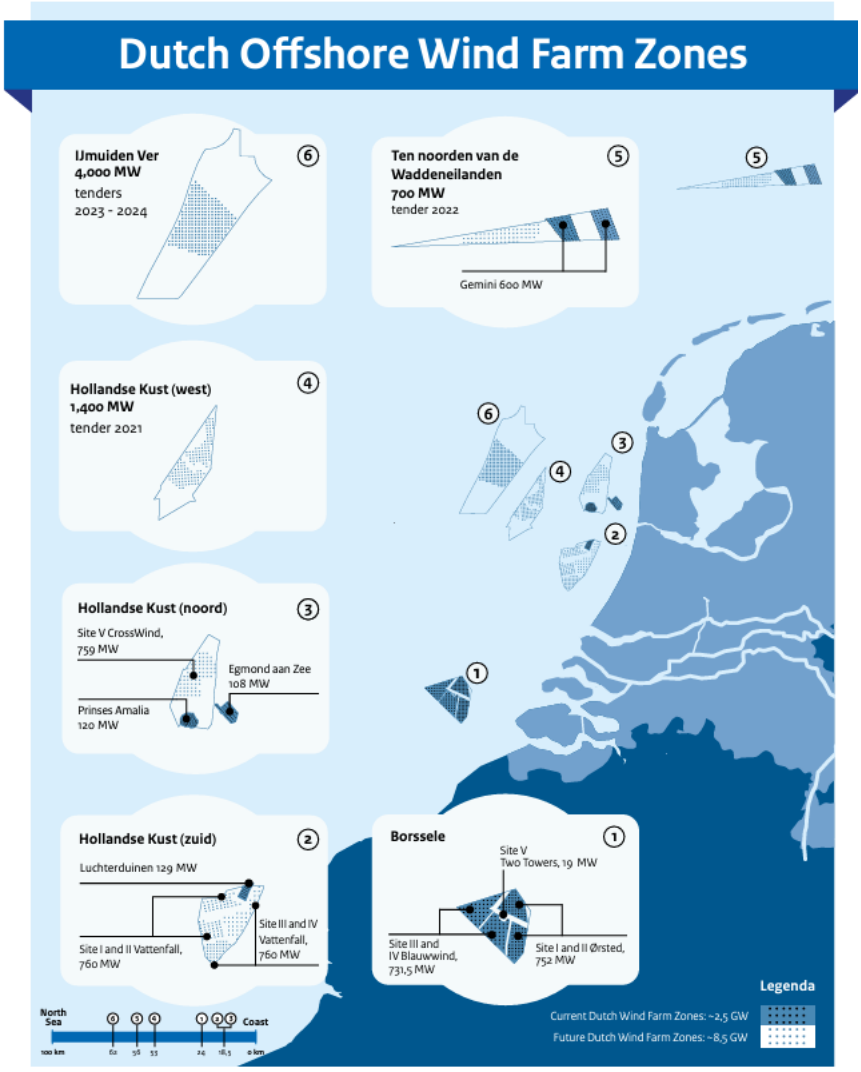

Figure 10: Offshore Wind Roadmap (NetherlandsEnterprise Agency)

While the growth of offshore wind energy is crucial for meeting climate objectives and achieving energy security, it must be balanced against other priorities, namely biodiversity conservation and sustainable food production. The Netherlands remains bound by its international and EU commitments to protect marine biodiversity, which aim to safeguard vulnerable species and habitats. Moreover, maintaining sustainable fisheries is essential for food security, adding another layer of complexity to marine spatial planning. The overlapping transitions of food, energy and nature in the North Sea demand a coherent and integrated policy approach that prevents or minimizes conflicts and ensures that different uses of the sea can coexist. The main challenge for the decision and policymakers in the Netherlands is to safeguard a healthy, sustainable North Sea, that accommodates renewable energy while preserving marine biodiversity and allowing for sustainable fishing practices. The dire need to strike such a delicate balance is reflected in both the North Sea Agreement and the North Sea Programme 2022-2027, which seek to align the Netherlands' climate and biodiversity goals with its broader economic and environmental interests.

These national policies also dovetail with the EGD's ambitions for a sustainable blue economy. The EU's Blue Economy Strategy emphasizes the importance of integrating environmental sustainability with economic growth in maritime sectors, underscoring the need for innovative, multi-use approaches to marine space. As showcased in several documents, **the Dutch North Sea policy appears to have fully embraced the policy developments brought forward by the EGD and the Sustainable Blue Economy Strategy**.[27] In that regard, the Dutch government has committed to identifying sustainable solutions that reconcile the competing interests of fishers, energy companies and environmental NGOs. One crucial aim is to streamline the planning and authorization process for wind farms in a way that integrates energy, climate and biodiversity objectives.

Against that background, this case study aims to explore the key national legislative, regulatory and policy instruments shaping the future of the energy transition in the Dutch part of the North Sea. It assesses the extent to which these frameworks balance the twin imperatives of promoting offshore energy and safeguarding marine biodiversity, as the Netherlands navigates the complex and interconnected transitions of energy, food and nature.

3.6 The Northern Adriatic Sea

Geographic scope and characteristics of the case study

The geographic scope of this case study is the Italian Norther Adriatic, extending from the Friuli Venezia Giulia to the Emilia Romagna Regions (Figure *11*). It includes the marine area between the Italian coastline and the delimitation of the continental shelf agreed with the facing countries of Slovenia and Croatia (Fig.1). Due to the several biophysical, anthropic, and governance-related land-sea interactions relevant for the case study, the geographic scope extends to land (as represented by the yellow arrows in Figure *11* below) including the watersheds of some of the major Italian rivers.

The Adriatic Sea is a semi-enclosed basin characterized by increasing depths and geomorphological features that vary markedly along a north-south gradient. Its northern part is rather shallow (about 35 m) and includes the largest continental shelf area of the entire Mediterranean Sea. Deltas, lagoons and wetlands characterize the dominant landscape of the coastal area. Some of the major Italian rivers flow into the Northern Adriatic Sea; from south to north: the Po, the Adige, the Brenta, the Piave, and the Isonzo Rivers. The supply of freshwater from these rivers strongly influences the Adriatic oceanographic characteristics (such as salinity and density) while conveyed nutrients make this area as one of the most productive in the Mediterranean.

[27] See letter regarding the receipt of the Blue Economy Strategy, also see in general numerous references to the EU GD instruments in the North Sea Programme 2022-2027.

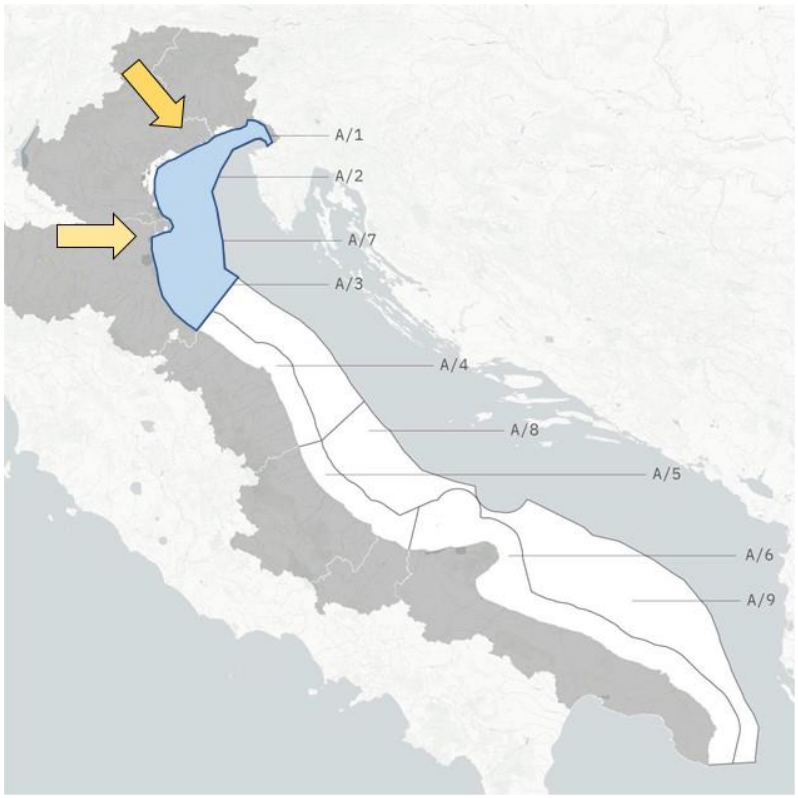

Figure 11: Geographic scope of the Italian Northern Adriatic case study (source: CNR, based on the MSP plan proposal for the Adriatic Sea, September 2022)

State of the art

The Northern Adriatic has a history of intense fishing pressure on natural stocks and habitats, with bottom trawling playing a relevant role in this sense. The use of hydraulic dredges for shellfish collection is also responsible of impacts on benthic habitats (Pranovi et al., 2000). These two particularly productive fishing types (trawling and hydraulic dredges) are concentrated in this area and are together representing more than a third of national landings, as reported in the National Triennial Program for Fisheries and Aquaculture 2022-2024 (MASAF, 2022b). Lastly, as in other Italian areas, (artisanal) small-scale fisheries play an important socio-economic role: they operate using a great variety of fishing instruments and targeting a wide range of species. Additionally, the Northern Adriatic presents the greatest density of long-line mussel farm plants in Italy, thanks to the favourable high trophic conditions due to the presence of major rivers. The area also hosts important activities of clam farming (*Ruditapes philippinarum*) located in coastal wetlands (lagoons and Po delta) and some extensive fish farming within the Venice and Marano-Grado lagoons. Concerning mussels farming in general, the Regions with the highest production are Emilia-Romagna and Veneto, which together represent about 70% of national production (Marino G. et al, 2020). At the same time, the Northern Adriatic hosts important biodiversity hotspots (such as coastal wetlands and rocky outcrops habitats) and megafauna species (*Tursiops* and *Caretta caretta* in particular). Policy and planning integration is essential to ensure the proper and coherent management of sectors and resources.

Introduction to the governance system

The framework of fisheries and aquaculture sectoral policies is composed of various multi-level governance mechanisms.

At the international level, relevant sources are the GFCM recommendations on the geographical subareas (GSAs) 17 and 18 in the Adriatic Sea (even if only GSA 17 is spatially overlapping with the North Adriatic Sea). These recommendations are particularly relevant for the management of small pelagic fisheries and demersal fishing activities. At the EU level, these are partially integrated, e.g. in yearly Council Regulations fixing the fishing opportunities for certain fish stocks and groups of fish stocks in the Mediterranean and Black Seas.

At the national level, the Ministry of Agriculture, Food Sovereignty and Forestry (MASAF) ensures uniformity and implements obligations imposed by EU and international laws. Moreover, Regional administrations are responsible for the design and implementation of the AZAs (Allocated Zones for Aquaculture) plans and for the adoption of specific plans for the management of fishery and aquaculture activities in internal and transitional waters. Some relevant examples of these plans are the Management Plan of the Marano and Grado Lagoon, identifying the permitted fishing gear and usage areas to ensure the protection of biodiversity and sensitive species (Decree 2019/2023) adopted by Friuli Venezia Giulia Region and the Regional Fishery Chart (DGR 1747/2022) adopted by Veneto Region, that includes management plans for fishing activities in inland and transitional waters. Lastly, at the local level, an important role is played by two consortia responsible for the management of some fishing resources. These include (i) consortia for the management of bivalves, which can regulate their activities at the local level, e.g. by adopting more restrictive measures than the limits imposed by national and EU regulations, and (ii) CO.VE.P.A. (Consorzio Veneto Pesca Artigianale), a consortium of fishers operating in the Veneto region, aiming to preserve, enhance, and promote small-scale artisanal fishing, e.g. by providing coordination and support to the activities, promoting training initiatives for fishers as well as research in the field.

The presented complexities in the management of two of the most important socio-economic activities in the area (i.e. fishing and aquaculture), with multiple levels of governance and competences, call for an integrated management and planning. It is for this reason that the case study aims at investigating the level of coherent internalisation and integration in the sectoral policies of the requirements for healthy marine ecosystems provided by the framework directives (WFD, MSFD, and MSPD), also considering the essential role that such an environment play in supporting the two activities. The case study also aims at analysing the contribution of the sectoral policies towards cross-compliance in supporting the delivering of the EGD objectives related to nature conservation (in particular improved protection toward the targets set by the EU Biodiversity Strategy).

3.7 The French Mediterranean

France has marine territories in three of the EU basins: North-Atlantic, the North Sea and the Mediterranean. To cover this wide diversity, France has a centralized administrative organization, particularly when it comes to designing marine strategies. Since 1982, certain powers have been decentralised with the creation of regional administrations. For the marine

environment, the guidelines and strategies are decided at the national level and declined and implemented at the regional level. Sectoral policies (fisheries and offshore wind) are centralised and compartmentalised bringing their own set of regulations and institutions. To highlight the management and implementation of marine related policies in France, the case study focuses on the French Mediterranean Sea, more specifically the Provence-Alpes-Côte d'Azur administrative region. Figure *12* shows the scope of the Mediterranean French case study.

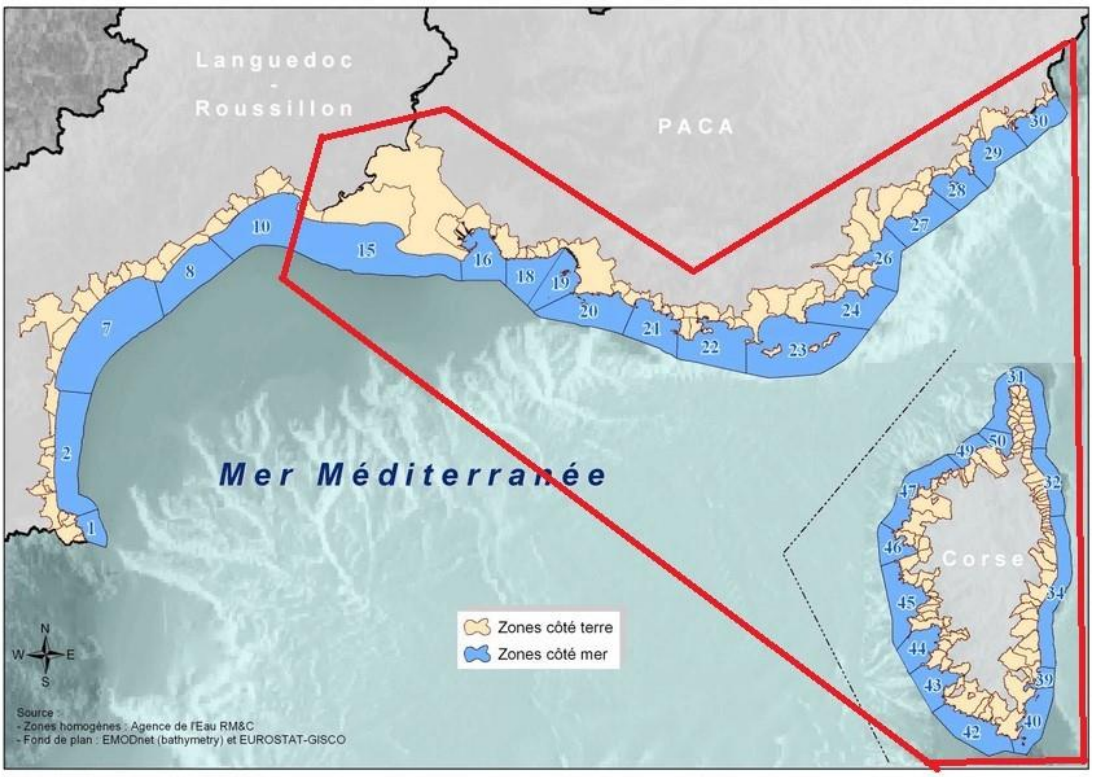

Figure 12: Geographic scope of the French Mediterranean case study. This map shows the French Mediterranean coastline divided into (1) landward zones: groups of coastal municipalities; (2) seaward zones: homogeneous SDAGE zones.) (Poileton et als, 2015).

Even though the Mediterranean represents only 0.7% of the surface area of the oceans, it is one of the major reservoirs of marine and coastal biodiversity, with 28% of endemic species and 7.5% of the world's marine fauna and 18% of its marine flora (SPA/RAC, Biodiversity in the Mediterranean Sea) . Despite that, in 2023 20% of the fishes landed in the French ports still came from overfished stocks and 2% from collapsed stocks (Ifremer 2024).

Blue economy is of key importance for the French national economy. In the Mediterranean Sea, the most important economic sector is tourism. Two other sectoral policies are at the core of the marine spatial planning: fisheries and energy because they contribute to the self-sufficiency of France. French fisheries represent a profit of 1.3 billion[28] EUR in 2020, but the Mediterranean fisheries represent only 3% of these catches. France now has 976 MW of installed offshore wind power capacity with only two pilot farms in the Mediterranean Sea. The French perspective on offshore wind energy is very ambitious with the project of building

[28] https://www.insee.fr/fr/statistiques/4277862?sommaire=4318291

offshore wind farms by 2050. However, these two sectors are at the heart of political debates and their implementation mechanisms are very often nationalised, which makes them sectoral policies that are potentially disconnected from the measures and objectives of marine biodiversity management documents (WFD, MSFD, Natura 2000).

3.8 The Mediterranean Sea

The Mediterranean Sea (Figure *13*) presents the second largest biodiversity hotspot in the world. The region is highly fragmented (politically, culturally, demographically, and socio-economically), with a pronounced north-south divide. The northern countries tend to be economically rich, EU member states or candidate countries, while southern and eastern states are significantly poorer, with growing populations (Critical Ecosystem Partnership Fund - CEPF, 2017). The marine policy landscape of the Mediterranean is complex, due to the interplay between the EU, Mediterranean level, and international policies, which bring with them a wide variety of different actors.

Figure 13: Map of the Mediterranean Sea and its coastal countries (source: WorldAtlas.com, accessible: https://www.worldatlas.com/seas/mediterranean-sea.html, last accessed: 7.6.2024)

This case study aims to study the implementation of the Green Deal marine policies, with a focus on biodiversity and climate change integration in the fishery policies, and the challenges of cross-compliance across the Mediterranean Sea basin area. However, the Mediterranean Sea is shared between 22 coastal states, only eight of them part of the EU (with addition of Monaco,

with close EU ties, and four EU candidate states, CEPF, 2017). Consequently, the European Green Deal is only directly relevant for the minority of the Mediterranean countries and the policy scope of the case study needs to be broadened beyond EU legislation.

The United Nations Environment Programme Mediterranean Action Plan (UNEP/MAP) and Plan Bleu (2020) identify eight major threats to the Mediterranean environment and development, with fisheries being one of them. General Fisheries Commission for the Mediterranean (GFCM, 2023) assessments show that 73% of assessed fish stocks in the Mediterranean are overfished, with only about 50% of all stocks being assessed. This is a decrease from 88% in 2014. Additionally, 18% of catches are discarded (depends considerably on the type of fishing gear used).

Moreover, climate change is further exacerbating the situation, as the basin is warming and acidifying faster than the global average, forcing movements of fish species and a high rate of biological invasions. Economic activities in the region, including fisheries, are inextricably linked to the climatic and environmental conditions. While there is a long history of highly diverse fisheries, contributing to economy, health, and wellbeing in Mediterranean nations, those are now threatened. The influence of climate change on fisheries is complex, but since most Mediterranean fish stocks are overexploited, the whole sector is more vulnerable to further pressures (MedECC, 2020). At the same time, changing environmental conditions are also affecting rich biodiversity, as the warmer waters have already led to mass mortality events in coralligenous habitats, sponges, and among molluscs, while seagrass meadows are also regressing. The degradations of seagrasses and coralligenous assemblages can both be, at least partly, linked also to fishing practices (UNEP/MAP and Plan Bleu, 2020). While almost 10% of the Mediterranean is formally protected in MPAs, only about 10% of them are considered to be appropriately managed, and only about 0.06% of Mediterranean Sea enjoys strict protection (UNEP/MAP and Plan Bleu, 2020).

The environmental and anthropogenic pressures on the Mediterranean, as a whole, are doubtless even more complex. However, even this comparatively narrow focus on only three policy areas, already demonstrates daunting complexity of challenges on both environmental and policy sides.

4. Results from individual case studies

This chapter presents the results obtained for each individual case study for the Task 3.3 research questions, as well as for additional case-study specific questions reflecting contexts and specific problematic areas.

4.1 Agriculture in the Finnish Archipelago

One case study covers the links between the agricultural sector, EU directives and the EGD (Figure *14*).

Figure 14: The 2 case studies tackling the agricultural sector.

The Finnish CAP plan for 2023–2027 takes into account environmental requirements. For example, the WFD is included as a new statutory management requirement (SMR 1). In addition, the CAP plan includes a new voluntary eco-system subsidy for farmers. As described in the National CAP Plan, the agricultural measures in the RBMP are coordinated with those in the CAP. The CAP is one of the instruments for the implementation of the RBMP. However, **it is still questionable whether agricultural subsidies provide sufficient incentives for environmentally friendly practices to achieve healthy marine ecosystems**.

The Roadmap for the Archipelago Sea Programme includes agricultural water protection measures on a wider scale. The most significant effect of the measures described in the roadmap on nutrient loads to the Archipelago Sea is the increased use of soil improvers such as gypsum and lime on fields (Laurila et al., 2022). Gypsum and lime are also included in the new water protection methods of the RBMP (National Planning document for water management measures for 2022-2027). To overcome the bottlenecks in targeting and communicating measures, the program emphasises soft and voluntary policy instruments. **Several measures in the Archipelago Roadmap are based on the transfer and distribution**

of information (Laurila et al., 2022). When working with soft and voluntary instrument, cooperation between stakeholders should be strong and have an efficient institutional basis to achieve water protection objectives.

In the agricultural sector, the CAP 2023-27 is a key instrument for achieving the GD objectives of Farm to Fork and Biodiversity Strategy (European Commission, the common agricultural policy: 2023-27). **The national CAP Plan for 2023 – 2027 contributes to the objectives of the Green Deal**. For example, it includes an evaluation of the consistency with the Farm to Fork strategy. The national CAP has taken account of environmental requirements; for example, it includes new requirements in relation to the conditionality of environmental subsidies (Finland's national CAP Plan for 2023–2027).

However, there is a **challenge in financing agri-environmental measures and targeting them to the most problematic areas**. The subsidies available for the measures are often insufficient and are not implemented due to a lack of profitability. This has been the case, for example, with subsidies for protection strips (Westerberg et al. (eds.), 2022). Therefore, improvements in the subsidies for individual effective measures (e.g. protection strips and collector plants) have been requested (Laurila et al., 2021).

The main coherence challenge that the interviewees pointed out was between the environmental payment scheme of agriculture and the environmental licensing of the aquaculture sector. It is the interviewees' view that because of the strict requirements for environmental licensing, although aquaculture has improved in terms of nutrient load to the Baltic Sea, the agricultural sector has done little or even increased its nutrient load. To tackle this problem, policy coordination across sectors would be required, aiming at the management of the cumulative nutrient load to the Baltic Sea through improved coherence, technological development and nature-based solutions (NBS)[29]. Consequently, incoherent policy goals, lack of effective measures for the management of cumulative nutrient load, tightening permit requirements and a lack of clear strategy for the renewal of the aquaculture operators hinder the development of the entire aquaculture sector[30]. Furthermore, further policy integration of environmental topics into the core of economic policies is needed.

4.2 Aquaculture and fisheries

Four case studies cover the links between the sectors of aquaculture and/or fisheries, EU directives and the EGD (Figure *15*).

[29] Puharinen, S.T. (2021). Good Status in the Changing Climate? - Climate Proofing Law on Water Management in the EU. *Sustainability*, *13*(2), 517. https://doi.org/10.3390/su13020517

[30] Valve, H., Lukkarinen, J., Belinskij, A., Kara, P., Kolehmainen, L., Klap, A., Leskinen, R., Lähteenoja, S., Marttila, T., Oikarinen, M., Pitzén, S. (2019). Lisäarvoa kalasta ja maatalouden sivuvirroista Varsinais-Suomessa: Sinisen biotalouden murrosareenan tulokset. Demos Helsinki.

Figure 15: The 5 case studies tackling the aquaculture and/or the fisheries sector(s).

4.2.1 Finnish Archipelago

The aquaculture strategy of Finland aims at the sustainable growth of the sector, while referring to the water and marine management objectives (Finnish Government, 2022a). In addition, Finland's bioeconomy strategy proposes to multiply the added value of aquatic biomass while achieving and maintaining good status of waters (Finnish Government, 2022b). However, **the objective of increasing fish farming does not seem to fully internalise the objective of healthy marine ecosystems** (Westerberg et al. (eds.), 2022). The challenge of reconciling these objectives has been identified in the Marine strategy: it stresses the challenge of reconciling the aquaculture strategy and the blue bioeconomy with the objectives of water and marine management objectives. If targets proposed for increased aquaculture were implemented, the nutrient load to the sea would increase (Laamanen et al. (eds.), 2021). **It is unclear whether the aquaculture sector** and the sector development foreseen by sector policies **is in line with the GD's zero pollution objective.** At the same time, the nutrient load to the Archipelago Sea from other sectors should be reduced to achieve GD objectives.

The impact of nature conservation areas has also been addressed in some of the sectoral plans of economic activities. The National aquaculture location management plan outlines that aquaculture activities are generally excluded in nature conservation areas. In Natura 2000 sites, aquaculture activities are allowed if they do not significantly degrade the habitats or species on the basis of which the sites are included in the network.[31] However, in terms of reconciling activities and nature conservation a significant part of the valuable underwater marine biodiversity areas are outside the existing protection network. This was pointed out in a Zonation-analyse made in 2018.[32]

[31] The National aquaculture location management plan, p. 13.
[32] Finnish Marine Strategy part III: Program of measures of the Finnish Marine Strategy 2022–2027, p. 239.

The fish farming sector's impact on water quality and biodiversity depends on where the operation is located, and the technology used. At the level of policy goals, there are incoherences that have led to a situation in which it is unclear to the businesses, governmental authorities, NGOs and other societal actors operating in Finland which direction the sector should take. For example, investments in the aquaculture sector are encouraged by the EU and national policies, and at the same time, both the EU and national water management objectives aim to achieve the good ecological status of waters. Meanwhile, water and marine environmental policies aim at an improved status of coastal and marine waters and the subsequent decrease in cumulative nutrient load from different sectors, including aquaculture. In line with the MSFD, the Baltic Sea Action Plan (BSAP) aims at a good ecological status in the Baltic marine environment. The incoherence of policy goals does not offer clear pathways for the future development of the aquaculture sector in Finland[33].

4.2.2 Northern Adriatic Sea

The Italian governance framework for sectoral policies is composed of various multi-level mechanisms. At the international level, relevant elements are the GFCM recommendations on geographical subareas (GSAs) 17 and 18 of the Adriatic Sea (although GSA 17 only is spatially overlapping with the North Adriatic Sea). These are framed in the Management Plan on small pelagic fisheries in the Adriatic Sea (firstly adopted in 2013 then updated in 2018) and the Multiannual Management Plan for sustainable demersal fishing activities in the Adriatic Sea (adopted in 2019 and updated in 2022). Furthermore, at the EU level, these are partially integrated in yearly Council Regulations (the most recent being (EU) 2024/259) setting for 2024 fishing opportunities for certain fish stocks and groups of fish stocks applicable in the Mediterranean and Black Seas. Chapter III is dedicated to the Adriatic Sea (GSA 17 and 18, therefore Italy, Croatia and Slovenia) and regulates the fishing activities for small pelagic stocks (article 10), demersal stocks (article 11), and data transmission (article 11).

At the national level, the programmatic instrument for the aquatic production sector is the National Triennial Program for Fisheries and Aquaculture (2022-2024). This program provides a general framework to reach CFP objectives by achieving the macro-objective of sustainable development of fisheries and aquaculture while strengthening measures aimed at achieving Maximum Sustainable Yield (MSY) for all stocks by 2025. The Program does not provide specific operative planning as it relies directly on the EMFAF National Operational Program and other sector management plans at the international (GFCM and EU) and national levels (in particular dedicated plans relevant to the North Adriatic Sea: the "National Management Plan for fishing activities using hydraulic dredges and trawl gear as identified in the naming of fishing gear in mechanical dredges including air-lift dredges (HMD) and mechanized dredges (DRB)" (2019) and the "Management Plan (under Article 24 of Regulation (EC) 1198/2006) GSA 17 Central-Northern Adriatic Sea – Trawl" (2011)).

Despite not explicitly aiming at reaching MSFD goals, these plans are aligned with targets on commercially exploited species set under D3, e.g. reducing the exploitation rate of species exploited by commercial fishing as well as the understating of IUU (Illegal, Unreported and Unregulated) fishing and related impacts**.** The first plan aims at maintaining the replenishment

[33] Soininen, N., Belinskij, A., Similä, J., Kortet, R. (2019). Too important to fail? Evaluating legal adaptive capacity for increasing coastal and marine aquaculture production in EU-Finland. *Marine Policy*, 110, 103498. https://doi.org/10.1016/j.marpol.2019.04.002

capacity of commercial stocks, reducing annual fluctuations in abundance and reducing the impact of harvesting on communities and targeted species. The second aims at reaching recovery of stocks within biological safety limits and achieving, in the case of demersal species fishing, improvements in the spawning stock biomass (SSB) through the reduction of exploitation rates.

The National Operational Program under the European Maritime, Fisheries and Aquaculture Fund – OP EMFAF (2021-2027) constitutes one of the main implementing instruments, providing coordination among sector policies and relevant Directives. Specifically, **Objective 1.3 aims at ensuring a sustainable use of fishing resources to achieve biomass extraction levels for all commercial stocks that can produce Maximum Sustainable Yield, in accordance with international agreements and in line with targets set under D3 of the MSFD**. Objective 2.1 aims at promoting sustainable aquaculture activities, particularly by enhancing production competitiveness and ensuring activities are environmentally sustainable in the long term**. This last objective** (aligned with the objectives of the National Strategic Aquaculture Plan (2021-2027) – an annex to the OP EMFAF, 2021-2027) is designed to support the **protection of all forms of water, ecosystem restoration, pollution reduction, and the sustainable use of water in accordance with the WFD, as well as the development of synergies between activities and space uses (in line with the MSPD).**

Furthermore, **a coordination instrument between aquaculture and the three Directives is provided by the Technical Guide for the Allocation of marine areas for Aquaculture** (designed by ISPRA in 2020). This guide has been developed in accordance with the EU objectives set under the WFD and the MSFD for GES achievement as well as the biodiversity conservation objectives of the H&BDs. The technical guide also includes **a specific section on the application of the ecosystem-based approach (EBA) in aquaculture planning, thus ensuring** coherence with **MSP and MSFD**, given the central role of EBA for the implementation of these two directives. Moreover, the guide specifies how the development of sustainable aquaculture activities under maritime spatial planning (with specific zoning, selection of sites and monitoring) need to be aligned with MSFD objectives. A relevant example of the application of the guide is provided by the draft AZA Plan for the maritime compartments of Chioggia and Venice (Resolution 1651/2023).

In addition to the national framework described above, other mechanisms supporting the implementation of sector policies include: (1) At the macro-regional level, the Northern Adriatic Fishing District that is the result of the cooperation and collaboration developed between the Regional administrations of Friuli Venezia Giulia, Veneto and Emilia-Romagna, together with the development of transboundary collaborations through projects with the administrations of Slovenia and Croatia. In particular, in November 2022, the Coordinator of the Northern Adriatic Fisheries District submitted proposals regarding management plans on different fishing techniques (e.g. fishing with hydraulic dredges, fishing with trawl nets, fishing with seine nets). The main goal of these management plans is to make these fishing techniques systematized in the area, aiming at a continuous update of data on the fleet and seafood production that could actively inform the process of maritime spatial planning (MSPD); (2) more transversally, **the Socio-Economic Observatory of Fisheries and Aquaculture, a structure for the monitoring and analysis of economic and social trends in the fishing sector in the northern Adriatic Sea area** (including Veneto, Friuli Venezia Giulia, and Emilia-

Romagna, as well as Slovenia and the Istrian Region of Croatia, which were partners in the initial ADRI.FISH community project under which the Observatory was created).

Lastly, at the local level, other relevant mechanisms supporting the implementation of sector policies **have rather indirect links to EU framework Directives.** For instance, concerning the fishing of bivalves, an important role is played by Consortia (e.g. Co.Ge.Vo.) made of bivalves' fisheries companies, whose purpose is the exclusive management of bivalve mollusc fishing in the sea, particularly the Venus clam (*Chamelea gallina*) and the smooth clam (*Callista chione*). The Consortia can regulate activities at the local level, e.g. by adopting more restrictive measures than limits imposed by national and EU regulations. Additionally, at the regional level, there are examples of plans regulating fishing activities for internal and transitory waters, e.g. the Management Plan of the Marano and Grado Lagoon that specifies permitted fishing gear and usage areas to protect biodiversity and sensitive species ((Decree 2019/2023) adopted by Friuli Venezia Giulia Region and the Regional Fishery Chart (DGR 1747/2022) adopted by Veneto Region).

To conclude, the main explicit and direct links among the sectoral policies of fisheries and aquaculture can be observed at the national level, while decrease becomes more indirect at the macro-regional and particularly at the local ones, also given the specificity and the spatial scale of these plans.

4.2.3 French Mediterranean Sea

In France, due to the exclusive competence of fisheries policy by the EU, the governance remains strongly centralised at the State level. Strategic plans and implementation mechanisms are designed by ministries, such as the 'National Action Plan for Sustainable Fisheries' (2022) and the French "National Maritime, Fisheries and Aquaculture Fund" programme. Decisions regarding the distribution of fishing quotas and sub-quotas are also made at the ministry level, taking into account total quotas allocated by the EU, recommendations from international organisations and scientific advice on the state of fish stocks. Quotas are then allocated among regional organisations.

France has established a series of laws and regulations to govern professional sea fishing, with the aim of ensuring the sustainable exploitation of marine resources. In this regard, the French Mediterranean regulation framework must be applied, taking into account both European and local considerations, as well as those specific to the Mediterranean region.

The Mediterranean framework and France

The General Fisheries Commission for the Mediterranean (GFCM) is the Mediterranean Regional Fisheries Management Organisation. GFCM assesses the status, provides advice, drafts and vote recommendations and guidelines. The GFCM recommendations are directly integrated into the CFP, which makes them obligatory for all EU Member States. For example, France has drawn up management plans for various fishing techniques, such as beach seining, purse seining, and dredging, implementing the GFCM's recommendations. These plans aim to ensure the sustainable exploitation of stocks and marine ecosystems, in line with the precautionary approach recommended by the GFCM. In addition, the GFCM has adopted measures to protect fisheries resources, such as the establishment of closed seasons for certain fisheries. These measures are then implemented by the Member States in order to preserve fish stocks and ensure the sustainability of fishing activities.

In the western Mediterranean, France imposes an annual ban on the use of bottom trawls up to 6 nautical miles from the coast in the Mediterranean Sea for a period of three months, generally from May to July, to protect fish stocks and sensitive marine habitats. These measures are part of the multiannual management plan established by the EU to limit pressure on demersal species while respecting scientific recommendations to achieve sustainability objectives. These ban periods may be adjusted to suit specific regions, such as the Gulf of Lion, to take into account local ecological particularities and the needs of fishing communities.

French National legislation and governance

The French Ministry for the Environment, more specifically the Directorate for Maritime Affairs, plays a pivotal role in implementing European fisheries regulations at the national level by establishing quotas and regulations[34] in accordance with European legislation and international agreements.

For instance, professional fishing requires specific authorisations at both the European and national levels. Vessels must hold licenses to carry out certain regulated fishing activities, and the Directorate of the Sea regularly updates the list of authorized vessels. The management of professional fisheries is primarily governed by *the Rural and Maritime Fishing Code*, which is complemented by several ministerial decrees that specify the implementation of legislative provisions. Some of these decrees are published annually, with some particularly relevant for the French Mediterranean case study, such as the Ministry Decree of 28 January 2013[35] which establishes the minimum size or weight for catching and landing fish and other marine organisms for professional fishing and the Ministry Decree of 8 September 2014[36] which implements authorization schemes for certain fishing gears techniques in the Mediterranean, in particular for bottom trawl fishing, and establishes the conditions for granting these authorizations. The whole quota repartition for the Mediterranean Sea is managed by the Ministry Decree[37] of 4 December 2024 amending the amended order of 5 February 2024 on the allocation of fishing effort quotas for certain professional fishing activities in the Mediterranean Sea by French-flagged vessels for the year 2024.

Private stakeholders also play a key role in implementing the CFP and supporting marine biodiversity protection. The National Committee for Sea Fisheries and Marine Animal Husbandry (CNPMEM) represents all fisheries and marine aquaculture professionals and defends their general interests in dealing with national and public authorities. For membership of a fishing organisation and its quota system, arbitration for the distribution of quotas to new entrants takes into account 4 criteria, including the track record of the species fished by the vessel, the technical and economic project, the potential for revitalizing the area and the environmental impact of the vessel. Environmental impact of the vessel is only considered if two candidates reach the same grade for the three first criteria and cannot be ranked equally. It shows biodiversity protection and environment is still not a priority for the fisheries sector.

[34] https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000049084492
[35] https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000027064021
[36] https://www.legifrance.gouv.fr/loda/id/LEGITEXT000029441882
[37] https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000050756242

CNPMEM has established partnerships with the French Office for Biodiversity to train fishermen in the challenges of protecting biodiversity, and with the French Institute for Marine Research to monitor marine species.

The French regulation has evolved to better integrate environmental frameworks such as Art. 123 of Law n° 2016-1087 for the “recovery of biodiversity, nature and landscapes”. This article amends the French Environmental Code by introducing the concept of maritime spatial planning (MSPD), defined as "the process by which the State defines and organizes human activities at sea with an ecological, economic, and social perspective, excluding activities related to defense or national security" (article L219-5-1).This shift in focus signifies a move towards integrated management of marine activities, as opposed to the previous approach of quantitative management by species.

The local and regional fishery institutions can also play a pivotal role in implementing the EU fishery and biodiversity regulations. The Departmental Directorate is responsible for issuing fishing landing permits, operating under the authority of the Ministry of Ecological Transitions and its Directorate for Maritime Affairs. Port authorities verify that landings comply with the authorizations granted, particularly in terms of quotas and minimum catch sizes.

At regional level, the CRPMEMs are responsible for setting the opening and closing dates for fishing for certain species and for laying down the rules governing cohabitation between the various fishing professions. They also allocate fishing licences and implement measures to limit fishing effort, such as imposing minimum catch sizes, reducing vessel power, increasing mesh sizes or banning certain fishing gear.

In the PACA region, EMFAF is managed by the Regional administrative. Through this fund, the Region can boost fisheries sector through economic aid but also influence the implementation of the MSFD and EGD indicators and objectives by deciding on the conditionality of the allocation of these funds. Complementary funds can be distributed through FLAGs, a group of local stakeholders comprised of maritime professionals, associations, local authorities, businesses, and other relevant entities. These groups convene to select local projects supported through EMFAF funding making it effects more tangible at local level.

4.2.4 Mediterranean Sea

At the level of the entire Mediterranean, there is no obligation to internalise the requirements of EU policies, given that the majority of coastal states are not EU Member States nor part of the European Economic Area and thus not bound by the EU policies.

The CFP/GFCM technical measures in the Mediterranean focus on the “input measures”, which regulate the fishing fleets (e.g., time spent fishing, where and when to fish), rather than focusing on quotas (“output measures”). The issue with input controls is that while they are easy to measure as they occur before fishing, their enforcement happens at sea, which is challenging to properly implement. While the new EU Regulation 2019/1241 imposes new requirements to encourage MS to submit joint recommendations for such input controls (e.g., fishery restricted areas), so that they can become EU Delegated Acts, this instrument is difficult and time-consuming to use and has thus not been used much (Bellido et al., 2020, WP2

deliverables). It is also important to note that most policy measures and European regulations are designed for single species fisheries, which does not work in the Mediterranean context of mixed fisheries, with more by-catch (Piroddi et al., 2020, Bellido et al., 2020, Florentino & Vitale, 2021).

While it may seem that the quota systems imposed in the Atlantic, Baltic, and tuna fisheries might work better, the Mediterranean demonstrates a high diversity both in species targeted and fishing patterns, with a vast geographical dispersion of landing sites, therefore the "input controls" are more implementable and potentially more enforceable (Bellido et al., 2020, Florentino & Vitale, 2021). But **there needs to be more focus on enforcement and surveillance,** where lessons from ICCAT might come in handy (Bellido et al., 2020, Piroddi et al., 2020). This is particularly important as bycatch needs to be better managed in the Mediterranean mixed fisheries, with elasmobranchs remaining at high extinction risk, and no signs of improvements (Katsanevakis et al., 2020, Ramirez-Amaro et al., 2020). Florentino & Vitale (2021), conversely, argue that for small pelagics and deep water red shrimp, the adoption of quota management system would work better. Some drastic solutions of reducing the fishing effort between 50 and 80% to reverse the effects of overfishing were also proposed, but the socioeconomic costs of that would likely be too high (Florentino & Vitale, 2021).

The enlargement of MPA network is still aligned with all major policies, such as under the BDS 2030 (Kyprioti et al., 2021), GFCM Strategy 2030, and post-2020 SAPBIO, and together with CFP Joint Recommendations is seen as needed to increase resilience of the existing MPA network and to assure biodiversity conservation (Kyprioti et al., 2021, Katsanevakis et al., 2020). **MPA management efforts should focus on minimising anthropogenic pressures to ensure the persistence of foundational, habitat-forming species, providing them with more time to adapt and resist invasive species (Beca-Carretero et al., 2024, Katsanevakis et al., 2020).** Rilov et al. (2020) suggests application of systematic conservation planning in the MSP framework, which should also recognise the potential of some areas to serve as climate refugia (Katsanevakis et al., 2020).

In the context of the Mediterranean Sea, biodiversity is covered under the Specially Protected Areas and Biodiversity Protocol (SPA/BD) of the Barcelona Convention, while the Mediterranean EU Member States cover it through the application of Habitats and Birds Directives at sea, as well as through MSFD (Descriptors 1, 4, and 6 – biological diversity, food webs, and seabed integrity). Additionally, the non-binding EU Biodiversity Strategy for 2030, under the European Green Deal also applies. Since summer 2024, the new EU Nature Restoration Regulation is also in place for EU Member States and there are informal expectations that discussions on nature restorations will be tabled at the upcoming Barcelona Convention Conference of Parties (Egypt, December 2025, interviews), as well. Climate change is covered under the European Green Deal and the European Climate Law in the EU Mediterranean states, but there is no equivalent policy framework covering the entirety of the Mediterranean, apart from the Paris Agreement. Fisheries are managed through CFP for the EU Member States, and the GFCM, as well as International Commission for Conservation of the Atlantic Tunas (ICCAT).

The integration of CFP with EU marine environmental and conservation legislation has been a hot topic of discussion for decades. While all these policies fall under Integrated Maritime Policy, it has been argued that CFP does not adequately take into account the biodiversity

actions needed to achieve conservation policy goals (Payne, 2000). Sustainable harvesting of commercial fish stocks is also directly integrated into MSFD (Descriptor 3). However, the environmental and fisheries parts of it seem to still be handled relatively independently by usually separated public institutions. The examples of the EU Marine Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries, prepared by DG ENV and DG MARE together is a rare example of the two sectors working together at the level of the EU. Although, the Marine Action Plan has now also established a working group at the EU level, which brings together representatives of both fisheries and environmental competent authorities, to continue working together (interviews).

A similar situation can be observed at the level of the Mediterranean, where GFCM and Barcelona Convention are collaborating under a Memorandum of Understanding, with GFCM managing the Ecological Objective 3, thus the data are being shared and any fisheries actions are taken through GFCM (interviews). The Mediterranean Sea is still considerably overfished and considered one of the most overfished seas in the world (UNEP/MAP & Plan Bleu, 2020, FAO, 2023). The situation has been improving in the last decade, thanks to the efforts of GFCM and others, but it is far from ideal (FishForum, interviews, FAO, 2023).

Recently, the high-level policies at the level of the Mediterranean, such as post-2020 Strategic Action Plan for Biodiversity – SAP BIO (which mirror the ambitions of EGD and its Biodiversity Strategy for 2030) have been fully aligned with strategic documents of the GFCM, such as GFCM Strategy 2030 (which is also reasonably well aligned with CFP, interviews). However, an analysis of species that should be protected or managed under different Action Plans passed under the Barcelona Convention's SPA/BD Protocol appearing in GFCM Decisions shows that there remains a significant gap, despite the fact that the same states agreed the Action Plans and are adopting GFCM Decisions (but there are different sectoral authorities dealing with environment and fisheries). Furthermore, even though ICCAT is considered more effective in dealing with enforcement of its policies, addressing bycatch issues and similar, it does not collaborate formally with Barcelona Convention and only just recently signed a Letter of Cooperation with GFCM (interviews).

Going forward, there should be more of a consideration of how to make the process of using joint recommendations more straightforward and in the Mediterranean to link up this work with GFCM's efforts on FRAs, since the spawning areas are crucial to be protected.

Additional challenge, pointed out in the literature is linked to the lack of product traceability and the underappreciation of the value of small scale fishery products. These features are one of the main influences leading to the intensification of exploitation of fish stocks and environmentally damaging practices. Small scale fishers are better aligned with sustainability goals in comparison with industrial fisheries. The policy orientation of fisheries' sustainability has not had much of an impact on the markets, as it takes more than new policies to transform long-standing market systems, due to lock-in effects and institutional path dependencies (Penca et al., 2021). Requirements for traceability and labelling of products is necessary so that the small scale fishery products can be valued for their sustainability, seasonality, and practices (Penca et al., 2021).

The integration of climate change policies into either biodiversity or fisheries sectoral policies is even more limited, given that there is no Mediterranean-level climate policy yet. The Barcelona Convention's IMAP system (which is aligned with MSFD reporting and

assessment systems and cycles) is being revised to include climate change and a new Regional Activity Centre of the Barcelona Convention on climate change will be established in Türkiye by December 2025 (interviews, FishForum), to supplement the current climate change work carried out through MedECC reports that Plan Bleu RAC is preparing. Similarly, GFCM is in the process of constituting their expert network on climate change, which will then be able to advise them and transform the knowledge into management decisions (first meeting of the new network, 29th April 2025, FishForum). GFCM has formed a climate change Task Force during the FishForum 2024, and this group will continue to coordinate the work on climate change and fisheries. Additionally, a new network of experts on fisheries and climate change will act as a pool for experts and knowledge who could be engaged in the expert working groups to support the functioning of GFCM. This process is currently in consultation phase (likely throughout July, decisions expected in December 2025). **Even on the EU level, while there have been successful mainstreamings and significant earmarking of funds for climate actions, these are not being fully used, due to persisting silos and governance issues in coordination of the use of those funds, particularly the EMFAF (interviews). The urgency and political will for climate action at the EU level has not been fully translated yet onto the Mediterranean one (interviews).**

More than 90% of existing Mediterranean MPAs are characterised by high vulnerability to climate change, with only 5.7% exhibiting high and very high stability (Kyprioti et al., 2021). So, the current MPA network cannot guarantee the resilience against climate change and continued effectiveness. A particular challenge are thermophillic invasive alien species entering through the Suez Canal, with endemic, habitat-forming species like *Posidonia oceanica*, being particularly vulnerable to being replaced (Beca-Carretero et al., 2024, Kyprioti et al., 2021). Additionally, since the Mediterranean is both a biodiversity and global climate change hotspot, it is projected that fish and other marine species will shift their geographical distributions (already happening), leading to decreases in functional and phylogenic diversity (Moullec et al., 2022).

In conclusion, it can be claimed that while high level policies among different sectors are admirably coherent, this coherence does not seem to reach the implementation decisions underneath them, at least not fully. Therefore, the two sectoral silos on biodiversity and fisheries continue to persist. There is a recognition of the game-changing impact of climate change, but the policy frameworks have not yet integrated climate change considerations into themselves fully.

4.2.5 How are biodiversity and climate change integrated in fisheries management - on paper and in practice?

Mediterranean Sea

Despite the presence of an existing policy framework, the Mediterranean basin is among the most impacted in the world, due to the combination of fishing, habitat loss and degradation, climate change impacts, eutrophication, and pollution, invasive species, climate change, and other stressors. The multiple stressors combine with the complex socio-political framework of the region, making it challenging to manage (Piroddi et al., 2020, Cos et al., 2022, Aurelle et al., 2021, Pisaro et al., 2020). European conservation policies have been judged ineffective in managing the complex Mediterranean situation (Katsanevakis et al., 2020). The Mediterranean countries also lack a shared vision and apply divergent conservation policies, consequently

limiting transboundary collaboration and large scale coherent ecological networks (Katsanevakis et al., 2020).

In relation to climate change, Pita et al. (2021) claim that northern Mediterranean fisheries target more climate vulnerable species, while northern African states are in general more vulnerable to climate change. They hypothesise that fishing is likely to negatively impact the growth rate of exploited species, reducing their resilience and recommend more MPAs to buffer the impacts of climate change and increase species resilience. **Despite the existing policy framework, there is a lack of a formalised process to provide and integrate advice in support of the ecosystem approach into EU fisheries management**, with barriers being identified among the lack of capacity to operationalise the concept (Ramirez-Monsalve et al., 2021). Therefore, it is important to investigate how biodiversity and climate change policies are integrated into the Mediterranean fisheries policies.

There is a recognition of climate change as a significant threat to biodiversity and having an impact on Barcelona Convention policy framework, but while the monitoring of impacts on MPAs (marine protected areas) is not comprehensive, the assessments of potential impacts on the socio-economic systems are non-existent (Plan Bleu, 2020). Plan Bleu (2020) has recommended four indicators, with the first one linked to fisheries and their revenue per unit effort, while also believing that MPAs may play a vital role in understanding climate change impacts on economic and social systems. Additionally, MPAs can contribute to protection of blue carbon habitats and mitigating the impacts of climate-driven events (e.g., tidal surges, storms, waves, floods, Plan Bleu, 2020). However, the integration of biodiversity actions with climate actions has not happened yet systematically. Despite marine ecosystem changes already being observed, climate change is only rarely considered operationally in EU MSPs (Marine Spatial Plans) and MSFD Programmes of Measures. While both the EU framework directives and IMAP are already intending to move away from sectorial management and working towards greater integration of climate change in both (interviews, FishForum), some would claim that MSP has the best potential to achieve that objective (Rilov et al. 2020). Yet, **there remains a challenge in the operationalisation of sustainable development between the powerplays of maritime activities and conservation objectives (Rilov et al., 2020).** The more and more common Mediterranean heatwaves impact species assemblages, which can experience long-term directional changes in functional identity, with consequences for ecosystem functioning. Heatwaves are mainly affecting taxa with large sizes, arborescent and massive morphologies, coloniality, high physical defences, slow-growing and long-lived, which often provide 3-D habitats for other species (Gomez-Gras et al., 2021, Pisaro et al., 2020).

Furthermore, climate change is not yet integrated with fisheries management either, at the level of the Mediterranean, not on paper and even less in practice (already detailed in Step 2 report). Neither the CFP (Common Fisheries Policy) nor GFCM (General Fisheries Commission for Mediterranean and Black Seas) have meaningfully integrated climate change considerations into their management. GFCM is in the process of setting up a climate change expert network to help them address these issues in their planning and there is a flurry of scientific activity with a variety of models being applied (FishForum). This process started during the FishForum 2024 and the subsequent establishement of the Task Force on Climate Change. In Spring 2025, GFCM was in the consultation phase for setting up the Network of Experts in Fisheries and Climate Change of the GFCM, which will function as a pool of experts to support GFCM with

information, analyses and discussions, under the coordination of the existing Task Force and could serve as the pool for ad-hoc expert groups that would then address case-by-case issues to support the work of existing GFCM Technical Working Groups and the work of the Commission (notes during the GFCM Event of the Network of Experts on Fisheries and Climate Change). ICCAT (International Commission for the Conservation of the Atlantic Tunas) is a bit more advanced in that, as they have already set up a working group on climate change, which is functioning, but it is also very early on (interviews). It is also important to note that even on EU level, with its ambitious climate change policies, DG CLIMA remains one of the smallest DGs and the majority of their work goes into mainstreaming climate changes into sectoral policies (interviews). However, regardless of the successful mainstreaming of climate change into other sectors, there were limited mentions of climate change during the 2025 EU Ocean Days, for example (more focus on fisheries, MSP, bycatch, competitiveness, growth, coastal livelihoods, as well as some on restoration and protection).

On the biodiversity side, biodiversity considerations should be better integrated, with all states and international organisations committed to Convention on Biological Diversity and its Global Biodiversity Framework (GBF). At the level of the entire Mediterranean policy coherence on paper has been achieved through aligning of the GFCM Strategy for 2030 and the Barcelona Convention post-2020 Strategic Action Plan for Biodiversity (SAP BIO, interviews). The two policy instruments are aligned and complement each other's goals, while also pursuing actions in the same timeframes. Apart from that, both ICCAT and GFCM work directly with the GBF (Global Biodiversity Framework) and BBNJ (Biodiversity Beyond National Jurisdiction Treaty) frameworks and have passed a variety of actions, mainly concerning bycatch (elasmobranchs, sea turtles, cetaceans) and depredation (cetaceans) issues (interviews, FishForum). Both ICCAT and GFCM also work with temporal and spatial fishery closures, with particularly GFCM working on a variety of Fishery Restricted Areas (FRAs), some of which are also being considered to be recognised as Other Effective Conservation Measures (OECMs) and so contribute to protected area targets for 2030 (FishForum). GFCM is also starting to work more on vulnerable marine ecosystems (VMEs), where they are lagging behind other RFMOs (Regional Fishery Management Organisations), such as NEAFC (North-East Atlantic Fisheries Commission) in the Northern Atlantic (interviews, policy analysis, Resolution GFCM/43/2019/6). During the 2025 EU Ocean Days numerous discussions about integrating fishers into spatial conservation measures were mentioned, with best practices of Torre Guaceto (Italy) and Cap d'Agde (France) often brought up, while the barriers that MPA managers face also often brought up in the same breath.

While these developments are positive, a policy analysis of the integration of biodiversity commitments into fishery management plans through GFCM Decisions has shown that a large proportion of action plans and species that require protection through EU or Barcelona Convention have not yet been integrated into relevant fishery decisions. Some interviewees even claimed that not only are some protected species still by-caught, some are still actively targeted and openly sold in Mediterranean fish markets (mainly focussing on elasmobranch species – sharks and rays). There are also infringement proceedings going on in some EU Member States for failing to implement bycatch monitoring measures, which are included both underneath GFCM and CFP, illustrating that even when relevant fishery decision are taken, they might not be implemented, with enforcement being weak at the level of the Mediterranean

(stronger through GFCM compared to Barcelona Convention, but still weaker than the EU, interviews).

A more successful example of integration of biodiversity and fisheries is provided by ICCAT's management of Atlantic bluefin tuna, which was on the brink of complete collapse due to overfishing. However, due to concerted effort, very considerable funding, expansive monitoring, thorough certification and traceability procedures, and sanctions in place has been successful. While interviewees admit that the process has been extremely difficult from the beginning, the bluefin tunas are now fished at sustainable levels, profitable, while the populations have recovered and are expanding back into their entire range (interviews, Heffernan, 2014). **A**dditionally, the policy analysis mentioned above also showed that ICCAT has a greater and more specific coverage of policy instruments to address the issues of cetacean, turtle, and elasmobranch bycatch within the tuna fisheries that they manage.

4.2.6 Do fisheries and aquaculture policies contribute to biodiversity conservation?

Northern Adriatic Sea

How sector policies contribute to the conservation of biotic resources and their sustainable use/exploitation, without compromising conservation goals (e.g. via the reduction of trawling, no-take zones, reduction of by-catch, etc.) is going through an on-going transition process.

The National Triennial Program for Fisheries and Aquaculture (2022-2024) includes in its introduction references to the EGD and its Biodiversity Strategy, referring to biodiversity conservation as one of the pillar of sector policies. Despite this, the link with EGD biodiversity goals is rather indirect, mainly based on the CFP objective of reaching MSY, reducing fleets capacity and intensifying control over IUU. Similarly, the objectives of the National Management Plans on hydraulic dredges and trawling, as presented above, are to some extent linked (indirectly) to biodiversity conservation, despite not referring specifically to the EGD. For instance, concerning dredge fishing of mussels, they: regulate the maximum daily quantity of clams that can be caught by each vessel: establish specific characteristics for the dredges (width, weight etc.); prohibit fishing of certain species with hydraulic dredges such as truffles; and regulate clams' discards. Moreover, concerning trawling, the plan includes measures regulating permanent and temporary fishing cessation, technical halt, fishing permits, minimum landing sizes, trawl net selectivity and areas prohibited from trawl net use (e.g. prohibition within 3 nm from the coast, or inside the 50-meter isobaths, on seagrass beds and other marine seagrasses and in biological protection areas). Trawling is permanently prohibited within the 3 nautical miles from the coastline baseline. In addition, MASAF annually issues a Decree with which it regulates the annual fishing ban for the various maritime districts. For instance, the one adopted for 2024 set the fishing ban for the Northern Adriatic Sea between 31st of July and 13th of September. Additionally, from July 1st to October 31st, in the main maritime districts of the area the Decree set the ban for the use of otter trawl nets, rapido trawl nets, and twin otter trawl nets within a distance of less than 6 NM, with the only exception of small-scale fisheries allowed to fish between 4 and 6 NM (up to 15mt long boats). Eventually, MASAF, in collaboration with local administrations and scientific institutions, can establish Biological Protection Zones (ZTB) where fishing is strictly regulated (e.g. trawling is in general prohibited). The study area includes several ZTBs of small/medium size: in the area between Filtri and Barcola that includes the Miramare MPA, tegnue di Chioggia, tegnue di Porto

Falconera Caorle, and Fuori Ravenna. Moreover, the scientific community has advanced a proposal for the establishment of the so-called "Soles Sanctuary" Fishery Restricted Area (FRA), located astride the demarcation of the continental shelf agreed between Italy and Croatia (activity carried out in the context of the DORY Project – Interreg between Italy and Croatia; Bastardie et al., 2017). Furthermore, a role of integration between fishery and biodiversity actions is played by the National Program under EMFAF (2021-2027). For instance, in its objectives EMFAF National Program aims at supporting (i) the reduction of fishing effort in overexploited GSAs (e.g., reference to pelagic trawling and purse seining for small pelagic stocks in the Adriatic); (ii) actions improving the environmental status of marine areas, aligned with MSFD spatial protection measures; (iii) with reference to MPAs and Natura 2000 sites, actions enhancing conservation, restoring degraded marine-coastal environments, and fostering cooperation between fishers and protected areas. In addition to this, the four FLAGs (Fisheries Local Action Groups) in the area, funded and supported by EMFAF, have an important role for the integration between biodiversity and sustainable fishing. For instance, in collaboration with research institutes and NGOs, they contributed to the development of projects for the protection of the Caretta Caretta (e.g. TARTATUR Project), by suggesting the use of more selective fishing instruments to avoid bycatch, developing recovery and release programs, education programs for fishers and monitoring presence and bycatch of turtles. Moreover, FLAGs were involved in the development of the management plans of the two marine Natura 2000 sites located in front of the Po Delta. These are two adjacent SAC sites designated by the Veneto Region (IT3270025) and the Emilia Romagna Region (IT4060018), in particular for the protection of the loggerhead sea turtle (*Caretta caretta*) and the bottlenose dolphin (T*ursiops truncatus*). The measures adopted by the Regions for the conservation and protection of the SICs (DGR 710 of 17/05/2021 by Emilia Romagna and DGR 1135 of 06/08/2020), make reference to the measures aimed at the reduction of the fishing effort in the area and integrate them, e.g. by banning the use of longlines and single or multiple hook lines. Additionally, other activities are forbidden in the area, such as windsurfing and kitesurfing, and close interaction with the individuals of the aforementioned species.

Concerning aquaculture, an important link to biodiversity is provided by the Technical Guide for the Allocation of marine areas for Aquaculture (designed by ISPRA in 2020) that supports the identification of marine zones suitable for aquaculture. Aquaculture activities have spatial and environmental interactions with other uses and economic activities and can generate, directly or indirectly, negative or positive externalities. These interactions can be classified as: incompatible, potentially compatible (e.g. with Natura 2000 sites) and compatible. The guide mentions also a distance to be respected (standoff distance), usually regulated by local administrations, with uses non-compliant with aquaculture activities. This buffer area aims at reducing the negative impacts aquaculture activities may have on other areas (e.g. MPAs). These guidelines have been followed, for example, by the Veneto Region for the elaboration of its draft AZA Plan for the Chioggia and Venice marine areas with Resolution 1651/2023. As required by the Technical Guide, the interaction between AZAs and protected areas was considered in the initial phase of identification of marine zones, As a result, the AZAs plan has located new aquaculture areas in sites that do not interact with MPAs or Natura 2000 sites. Moreover, in the final definition of the AZAs, other elements were evaluated and taken into consideration such as the interference with trawling fishing activities and maritime traffic (mostly in front of the Venice Lagoon and of its Malamocco inlets).To

conclude, **the way in which sectoral policies are (indirectly) contributing to biodiversity conservation and consequently to the EGD objectives related to nature protection, consist of limiting fishing and aquaculture activities by temporal, spatial, and technical measures** (e.g. gear regulations; permanent and seasonal bans; the design of areas with specific fishing restriction (e.g. Biological Protection Zones - ZTBs established at the national level or Fisheries Restricted Areas – FRA established under GFCM)), thereby supporting the restoration and protection of fish stocks and benthic habitats.

French Mediterranean

In France, fisheries are managed through two different tools: fundings and regulatory mechanisms. Fundings mainly includes EMFAF completed by national supporting funds. Fishery program of measure is designed at the national level and EMFAF funding is distributed at the regional level. Regulatory mechanisms are meant to implement the CFP and the GFCM recommendations. It includes licenses, quotas, landing obligations, fishing techniques control and periodical bottom trawling bans. If the regulatory mechanisms strongly support biodiversity conservation, fundings still have a more limited effect as there is no eco-conditionality to receive this funds and biodiversity protection is not its main objective (rather job conservation).

There is an interconnection between fisheries and marine biodiversity policies and program of measure. Fisheries is one of the sectors considered in the Annex "objective indicators" from the marine Façade Strategic Document that combines planning obligations of both the MSFD and the MSPD and links ecological and economic stakes (see D3.2 question 3). EMFAF funding, or the call called national recovery plan, can support financially the implementation of measures proposed in the programme of measures of the Façade Strategic Document[38]. At the national scale, the National Council of the Sea and Coastlines advised to set-up a national working group to monitor the implementation of environmental objectives related to fishing activities of the Façade Strategic Documents, accounting for around a third of its environmental objectives.

Within the EMFAF guiding documents, however, there is no explicit cross-references of the ecological objectives of the Façade Strategic Document except for the mention that fisheries must comply with the French Mediterranean Program of measure requirements. In practice, the process that delivers the MSFD, MSPD, and EMFAF strategic documents benefits from well-established bilateral discussions between the services of the Region (responsible for EMFAF) and the Interregional Directorate for the Mediterranean Sea (responsible for the MSFD and MSPD implementation). However, synergies at the (regional) operational scale are limited even though institutions are working together. For example, the Interregional Directorate for the Mediterranean Sea is not automatically consulted when EMFAF funding are granted to specific projects.

Interviews highlighted contradictory facts on the coherence between the Common Fisheries Policy implementation and marine-related planning. On the one hand, EMFAF must be coherent with the Façade Strategic Document. On the other hand, there are limited interactions between the design processes of both policies leading to contradictory objectives (economic

[38] National Council of the Sea and Coastlines , Notice on the Facade Strategic Documents, 12 of July 2021.

development prevails for sectoral policies, such as employment preservation for fisheries). This is illustrated by the fact that only one out of the 14 objectives of EMFAF relates to biodiversity protection while biodiversity protection objectives represents half of the Façade strategic document objectives. In addition, the state provides a financial support of 40 cts per litre of fuel through EMFAF, a subsidy for reducing operating costs of fishers with negative impact on climate change and very indirectly on the marine environment (via global warming, acidity, pollution). Such subsidies that can be considered as "harmful for the environment) are contradictory to some of the objectives of the French EMFAF National program that aim at "Improving energy efficiency and reducing CO2 emissions by replacing or modernising fishing vessel engines"[39].

Since 2021, it has been possible for regions managing EMFAF to consider actions aiming at biodiversity protection or the reduction of plastic pollution[40]. This new objective illustrates efforts for enhancing the coherence between fisheries policy and marine biodiversity-related policy objectives. In practice, however, EMFAF-funded measures addressing biodiversity are limited to financial support to staff hired to raise awareness or control activities in MPAs during the high touristic season to limit tourists impacts on ecosystems[41]. Also, the French Biodiversity Office (OFB) supports the Interregional Directorate for the Mediterranean Sea (DIRM) through EMFAF funding to carry out scientific studies and monitoring to assess, in particular, the impacts of fishing on habitats and identify good fishing practices.

During the EMFAF call for project drafting, the Interregional Directorate and the Region (managing EMFAF) work closely to ensure coherence between EMFAF-supported projects and the French Mediterranean Sea program of measures. The 2021-2027 national fisheries operational program is aligned with the priorities of the French mediterranean program of measure, focusing on environmental sustainability, innovation development, the promotion of sustainable aquaculture, and the marketing and processing of fishery and aquaculture products. A clear mention is made to Mediterranean MaS and the science-policy interface: "*Priority will be given to projects that include a dimension of improving knowledge of the impact of climate change on stocks of interest to fisheries. Projects will be able to draw on data sets collected within other frameworks, in particular data collected under the MaS (EMFAF specific objective OS1.4) or the MSFD*" [18].

[39] EMFAF National program 2021-2029, p114.

40 A total of 13 measures drive the EMFAF funding in the PACA Region: M1 - Aid for the first purchase of a fishing vessel, M2 - Aid for the replacement or modernisation of a main or auxiliary engine for a fishing vessel, M3 - Aid for the modernisation of fishing vessels (excluding engines), M4 - Aid to increase the gross tonnage of fishing vessels to improve safety, working conditions or energy efficiency, M5 - Aid for the modernisation of fishing ports, landing sites, fish markets, etc. Halls M6 - Aid for the passive collection of plastic waste at sea by fishermen, M7 - Aid for the protection and restoration of biodiversity and aquatic Ecosystems, M8 - Business start-up aid for new fish farmers , M9 - Aid for productive investment in aquaculture , M10 - Aid for investment in the marketing and processing of fishery and aquaculture products and processing of fisheries and aquaculture products, M11 - Aid for collective actions of regional interest for the development of sustainable fisheries, aquaculture and markets strand M12 - Support for the operation and management of FEAMPA LAGs (DLAL) M13 - Support for the implementation of DLAL strategies: enabling a sustainable blue economy in coastal areas and promoting the development of fishing and aquaculture communities fishing and aquaculture communities (including cooperation).

[41] Interview with a public administration representative implementing the biodiversity measure of EMFAF Provence-Alpes-Côte-D'Azur

However, despite these close links on paper, the National EMFAF strategy primarily focuses its biodiversity funds efforts on data collection and raising awareness in MPAs. **EMFAF is not yet sufficiently oriented to be used as a concrete incentive for fishing that is closely linked to the sustainable use of resources**. The main mechanisms for enforcing compliance with CFP stock sustainability objectives and MSFD indicators remain regulatory and coercive, through temporary bans and landing obligations.

Fisheries policies are closely related to **MSPD**. If we consider marine spatial planning as a management system balancing economic development and biodiversity protection, then there is still room for improvement for internalized ecosystem protection, especially through funding activities delivering positive marine biodiversity impacts. **Even if there is an improvement and attempt to better connect fisheries policies with MSFD, ecosystem protection is not yet fully well internalized and remains often kept at the strategic and communication levels**. No element was found on considering WFD objectives into fisheries policy as there is no direct link between this policy and the fisheries sector.

4.2.7 Do fisheries and aquaculture policies address biodiversity, climate change and resilience?

French Mediterranean

The EMFAF National strategy makes explicit reference to the European Green Deal and climate change mitigation, specifying: "*In addition to the section on climate change mitigation, EMFAF should help to support actions to adapt to climate change in response to the challenges posed by the latter for all fisheries and aquaculture sectors*."[42]. A clear mention is made to the Façade Strategic Document and the science-policy interface "Priority will be given to projects that include a dimension of improving knowledge of the impact of climate change on stocks of interest to fisheries. Projects will be able to draw on data sets collected within other frameworks, in particular data collected under the Façade Strategic Document (OS1.4) or the MSFD". However, studying further in detail the national strategy, climate change is mostly considered as a threat to economic activities to be studied. In addition, at the regional scale where the fundings are effectively granted, there is no explicit mention of climate change in the objectives and measures. In the funding granting, it is one variable among others but not the first priority.[43]

- Biodiversity: Regarding EMFAF, only 1/14 of the specific objectives is on biodiversity protection and it is a new objective (2022) which aims mostly at supporting MPA protection and do not regulate fisheries on potentially destructive techniques. Another example of mis-internalisation is the access to membership of a fishing organisation. For membership of a fishing organisation and its quota system, arbitration for the distribution of quotas to new entrants takes into account 4 criteria, including the track record of the species fished by the vessel, the technical and economic project, the potential for revitalising the area and the environmental impact of the vessel. Environmental impact of the vessel is conly considered if two candidates reach the same grade for the three first criteria and cannot be ranked equally.

[42] EMFAF French National Program, 2021-2029, p9.
[43] Interview with an expert implementing the EMFAF funding at the regional scale.

- Biodiversity: two regulatory mechanisms are driven by biodiversity protection: fishing periods restriction and geographical bans. There are 2 small area in the French mediterranean sea and hake stock has risen by 56%. Finally,wiithin MPA and Natura 2000 sites, the fisheries risk analysis, carried in application to the European birds' Directive gives priority to biodiversity protection because if a risk of undermining the site's conservation objectives, the fishing activities concerned must be subject to regulatory measures to reduce the pressure of the activity on the habitat or species concerned. However, France still do not ban trawling in MPAS.

As most of the objectives and actions in sector policies are dedicated to economic growth and preserving traditional jobs, EGD is not directly mentioned or mainstreamed by such policies in France. Taking the example of subsidies, no mechanism is set when proposing subsidies supporting fishers to assess their likely impacts on marine biodiversity and the achievement of the MSFD and EGD objectives as subsidies are justified on political and sector-demand grounds. For example, with the rise of fuel cost after the COVID pandemic, EMFAF funding has been used to support tax reduction (40cts per liter) for fishers. Today, these subsidies represent a high share of EMFAF total budget, while it could have been used to support energy and ecological transition for the sector. In addition, such subsidies are criticized on societal grounds as they benefit also industrial fisheries (more than 80% of EMFAF supports industrial fisheries) while at the same time some small-scale fisheries (e.g. in Corsica) do not beneficiate from EMFAF fundings because of the small size of their boats excluding them from some EMFAF financing.

Mediterranean Sea

At the level of the entire Mediterranean, there is no obligation to internalise the requirements of EU policies, as the majority of coastal states, being non-EU countries nor part of the European Economic Area, are not bound by EU policies. Additionally, since the scope of the case study is very large, limited attention is given at this stage to implementation at the national scale with the focus given to the Mediterranean sea-basin scale Barcelona Convention policies. Annex 2 provides details on alignment of EU marine environmental legislation with Barcelona Convention's.[44]

The case study has focused on the coherence between fisheries, biodiversity, and climate change. In the context of the Mediterranean, biodiversity is covered under the Specially Protected Areas and Biodiversity Protocol of the Barcelona Convention, while the Mediterranean EU Member States cover it through the application of Habitats and Birds Directives at sea, as well as through the MSFD (Descriptors 1, 4, and 6 addressing biological diversity, food webs, and seabed integrity). Additionally, the non-binding EU Biodiversity Strategy for 2030 under the European Green Deal also applies. Climate change is covered under the European Green Deal and the subsequent European Climate Law in the EU Mediterranean states, but there is no equivalent policy framework covering the entire Mediterranean Sea beside the Paris Agreement. Fisheries are managed through Common Fisheries Policy (CFP) for the EU Member States, and the General Fisheries Commission for the Mediterranean and

[44] further work on vertical integration of Mediterranean policies is still to be performed. This will partly be discussed in Marseille, and through a new round of interviews with either sub-national fishery organisations and different MPA managers

Black Seas (GFCM), as well as the International Commission for the Conservation of the Atlantic Tunas (ICCAT).

4.2.8 What are differences in policy integration between different scales in the Mediterranean Sea?

Building on the results of the case study-specific research question 1, it seems that while high level policies have been meaningfully integrated and made coherent with one another (SAP BIO and GFCM Strategy 2030, interviews) and there is active engagement of RFMOs in global biodiversity frameworks (ICCAT and GFCM in GBF and BBNJ, interviews FishForum), this integration starts unravelling when one moves to more specific implementation steps (see Annex 3). The species and habitats requiring protection are not always integrated into fishery management decisions and even when some decisions are taken, their implementation is entirely up to individual states with limited enforcement capacities from the international levels.

The integration at the international level of the entire Mediterranean is done through different ways of cooperating between the key institutions. The EU and Barcelona Convention have close ties, partly because eight out of the 22 of Barcelona Convention contracting parties are EU Member States and the European Commission is also a full member. Partly, this is also the result of the fact that Barcelona Convention and its Regional Activity Centres (RACs) lack the funds on their own to fully implement their policy frameworks and the EU is a major source of financing for them, both directly and through different projects in the region, hosting of different RACs (e.g., Plan Bleu in France, INFO/RAC-Information and Communication Regional Activity Centre in Italy, PAP/RAC-Priority Action Programme Regional Activity Centre in Croatia, SCP/RAC-Regional Activity Centre for Sustainable Consumption and Production in Spain, REMPEC-Regional Marine Pollution Emergency Response Centre in Malta, SPA/RAC-Specially Protected Area Regional Activity Centre in Tunisia, UNEP/MAP-United Nations Environment Programme Mediterranean Action Plan in Greece, interviews). Therefore, efforts have been ongoing for years already to as much as possible align the main overarching policy frameworks between both entities.

This process is most obvious in the case of the Barcelona Convention Ecosystem Approach system with its IMAP and Ecological Objectives and MSFD Descriptors of Good Environmental Status. Both frameworks are almost entirely aligned, with only a few minor differences. This alignment extends to monitoring and reporting requirements and implementation mechanisms. The countries are expected to provide marine environmental state assessments and data both to the EU and to Barcelona Convention (reporting through IMAP into INFO/RAC), with the two assessments being largely aligned, thus allowing EU Member States not to double their work (interviews). Similarly, the requirement to produce MSFD Programmes of Measures is mirrored with the need to produce National Action Plans for Barcelona Convention. There exist slight changes in how the two plans are to be produced, but the processes are largely streamlined. Some interviewees did however note, that despite this policy alignment, the way the reporting is set up, is actually quite different and for some assessments the monitoring programmes would need to be different between Barcelona Convention and the EU, thus introducing snags into this system, which only become obvious at national scales.

The cooperation between GFCM and Barcelona Convention is managed under a Memorandum of Understanding and is quite close, if sometimes described as challenging (interviews). All fishery related data and assessments that Barcelona Convention requires are supplied by the GFCM, which is the fishery "extension" of the Barcelona Convention. There is quite close cooperation also in place between the relevant RAC (SPA/RAC) with GFCM and a lot of work has been done on aligning the strategic documents of both frameworks (SAP BIO and GFCM Strategy 2030, interviews). Still, the interviewees note that there is a power imbalance at play, with GFCM being more powerful, influential, and better funded than the Barcelona Convention, while also having stronger enforcement mechanisms to use (some would still note that they are weak, just stronger than Barcelona Convention's, interviews). A key issue seems to be that the representatives of countries that attend relevant meetings underneath both policy frameworks are different and do not communicate with each other much. GFCM is attended by representatives of ministries responsible for fisheries, while Barcelona Convention is attended by ministries responsible for environment. Very rarely are those two ministries under the same roof and even if they are the relevant sub-ministerial sections tend not to communicate well with each other. These silos then result in the situation when one ministry agrees the protection of some species, for instance, but their fishery counterpart is either not aware or opposes the passing of relevant fishery measures to manage them, which is where the integration disintegrates (interviews).

The integration between GFCM and EU CFP is quite close. EU is an active part of the GFCM meetings and some have claimed the driving force behind it. All GFCM Decisions are also directly transposed into the CFP through Commission Implementing Acts. Some have claimed that this is relatively easy since GFCM decisions tend to be quite soft in their wording. Other interviewees have pointed out that the European Commission drafts a lot of the recommendations, which are then discussed at the GFCM, therefore representing a lot of the push for GFCM to adopt more decisions (a trend that can be observed over the years). The reverse process also sometimes happens, but not as often. However, on implementation the EU does take initiative with launching of infringement procedures against its own Member States, when it considers GFCM as not doing enough (interviews).

ICCAT tends to stand more independently from other frameworks. There is no direct cooperation with Barcelona Convention. A Letter of Understanding/Cooperation with GFCM was signed very recently and is more limited than what was initially planned. Additionally, ICCAT as an institution covers the entirety of the Atlantic, Mediterranean, and Black Seas, while the EU representation within it is just the European Commission. Given its management of highly profitable tuna stocks, ICCAT is less financially dependent on the EU and functions largely independently, particularly when compared to GFCM and Barcelona Convention (interviews).

It should be pointed out that despite the formalised agreements of the main policy frameworks to work on together, they all still have their own mechanisms for common themes, for example on climate change. ICCAT has its own established climate change expert group, GFCM is in the process of setting up its own Climate Change Expert Network, while within Barcelona Convention MedECC, currently provides climate change related knowledge, while a new climate change Regional Activity Centre is also being established. The extent to which these three different expert groups will coordinate beyond the cooperation among the general

frameworks under which they are established, is unclear, even though there are considerable spatial and expertise overlaps.

4.2.9 How are the EGD ambitions considered and internalised in fisheries at the Mediterranean scale?

Again, as before, the GD objectives do not have to be internalised into the sectoral policies at the Mediterranean level (such an expectation, given that majority of the Mediterranean countries had no say over preparing GD objectives would be problematic in its own right). However, if we consider the overarching objectives of the GD to ensure adequately addressing climate change, halting the biodiversity loss, and ensuring sustainable exploitation of resources as a broader objectives then we can analyse to what extent are those consideration present in Mediterranean sectoral policies.

Firstly, EGD's main objective is ensuring that climate change is addressed and its underlying European Climate Law sets an ambitious agenda of reducing emissions by 55% by 2030 and achieving climate neutrality by 2050. This level of ambition or the objectives is not replicated at the Mediterranean level. This is partly because a large proportion of Mediterranean countries are classified as developing states and are thus not committed to climate neutrality, nor do they bear historical responsibility for the emissions or the current level of crises in the same manner as their EU counterparts do. Therefore, beyond the Paris Agreement, there has been no further climate change policies passed at the level of the Mediterranean. There is a widespread recognition among the different institutions and sectors that effects of climate change will be serious and potentially catastrophic, given that the Mediterranean is already more affected than the global average (20% faster warming and acidification, incursions of non-indigenous species – lionfish, blue crab, interviews, FishForum, MedECC, 2020, Pita et al., 2021, Tuel & Eltahir, 2020, Gomez-Gras et al., 2021, Pisaro et al., 2020, Kyprioti et al., 2021, Beca-Carretero et al., 2024, Moullec et al., 2022). There have even been public admissions (FishForum) that the integration of climate change into Mediterranean policies is late, but it is moving there. There are new developments that aim at integration of climate change into the workings of Barcelona Convention (new climate change Regional Activity Centre to be established by the end of 2025, revision of IMAP system to include climate change) and GFCM (Task Force established, consulting on the establishment of Expert Network and defining the ToR for its functioning). In summary, on the topic of climate change, it can be claimed that sectoral policies have not yet internalised the climate change objectives and that there should be more impetus on defining climate change objectives first and quickly.

The objectives of sustainable exploitation of natural resources have been permeating fisheries management for decades already. While the Mediterranean remains overfished and continues to be one of the main threats to marine biodiversity in the sea basin, the amount of assessed commercial stocks, recognized as overfished has reduced significantly in the last years, by 31%, although it remains considerably too high at about 58% overfished (at only 50% of stock being assessed, FAO, 2023, UNEP/MAP & Plan Bleu, 2020, Piroddi et al., 2020). While GFCM is the main Regional Fisheries Management Organisation (RMFO) in the Mediterranean, even the marine waters of EU Member States that are managed under the CFP continue to be overfished (which has also been recognized by the Court of Auditors, 2020). The only truly successful case is the ICCAT's management of the Atlantic bluefin tuna fishery, where the bluefin tunas were brought from the brink of stock collapse to being harvested at sustainable level and able to recolonise much of their initial range (Heffernan, 2014). The

objective to achieve sustainable levels of exploitation are ingrained into the policies and the policy instruments. However, it seems to be the extent of management decisions adopted and their implementation (and enforcement) that remain the challenge when reaching those objectives.

All different sectoral policies (Barcelona Convention, EU, GFCM, ICCAT) are also fully committed to the Convention on Biological Diversity and its Global Framework for Biodiversity with 30:30 targets, as well as the High Seas Treaty (Biodiversity Beyond National Jurisdiction), all of which align with the EGD. The exact roles of RFMOs in this process are still to be defined (interviews). However, both of them are already actively working on the fishery-related biodiversity issues, such as bycatch and depredation (GFCM mainly through projects and ICCAT through their internal working groups). Additionally, GFCM is also active in determining the requirements for OECMs (Other Effective Conservation Measures, contributing to 30:30 targets), particularly in relation to determining which of the already existing or future Fishery Restricted Areas in the Mediterranean could be considered as such (interviews, FishForum). On less positive notes, there have also been criticisms that there is not enough real engagement of the fishery sector with the biodiversity sector, which is exemplified by the low level of implementation of MPAs, the widespread continued fishing in the protected areas, and the fact that numerous species that require protection are not yet included in GFCM management decisions (interviews, see Annex 3). The Mediterranean also seems to be lagging behind the incorporation of vulnerable marine ecosystems into fishery management (Resolution GFCM/43/2019/6 does mention them, but the restrictions are not as strict as in many other RFMOs, interviews). The persistence of strong sectors, which have not yet been fully bridge and lacking political will to fully tackle biodiversity crisis is holding back the achievement of the biodiversity objectives (interviews). Similarly, no discussions on marine nature restoration approaches have been held at Mediterranean level, but will likely be tabled for the next Conference of Parties in December 2025 (interviews).

4.3 Offshore wind energy

Five case studies cover the links between the offshore wind energy sector, EU directives and the EGD (Figure *16Figure 15*).

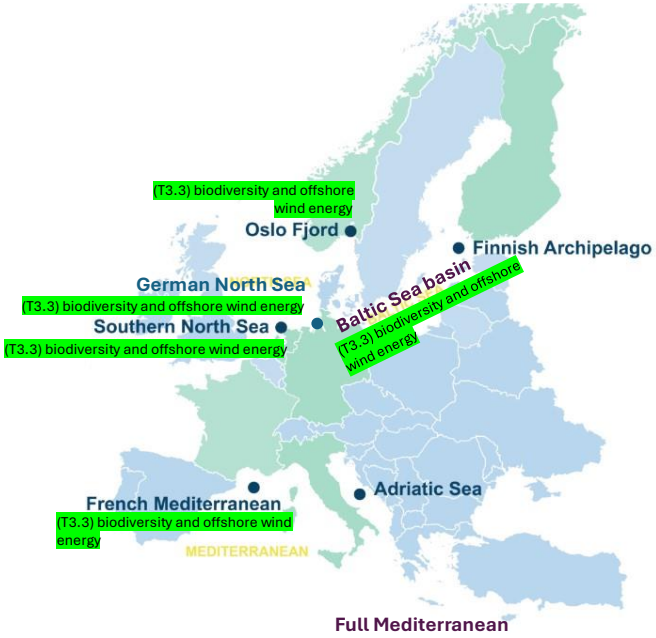

Figure 16: The 4 case studies tackling the offshore wind energy sector.

4.3.1 Offshore wind energy in the Baltic Sea

The current state of coherence and cross-compliance in relation to biodiversity and aquaculture

Regarding biodiversity, the large-scale expansion of offshore wind farms in the Baltic Sea will result in widespread activities related to construction, operation, and decommissioning, potentially causing significant negative cumulative impacts.[45] These risks and adverse effects of OWE on biodiversity create several challenges for the planning of offshore wind farms.

A solution-oriented approach could consist in multi-use concepts in the planning of OWE in the Baltic Sea. In this context, 'multi-use' refers to the intentional co-location of two or more maritime activities within the same marine space, with the aim of optimising spatial efficiency and fostering synergies between sectors. This is an essential perspective, given the limited

[45] R Dietz et al, Marine Mammals: Investigations and preparation of environmental impact assessment for Kriegers Flak Offshore Wind Farm. EIA - Technical Report June 2015, p. 165 and 170–172; LM Bergström et al, Cumulative Impact Assessment for Maritime Spatial Planning in the Baltic Sea Region. Pan Baltic Scope 2019, p. 60; M Reckermann et al, Human impacts and their interactions in the Baltic Sea region, Earth Syst. Dynam., 13, 1–80, p. 49; Nordic Energy Research 2022, Accommodating Biodiversity in Nordic Offshore Wind Projects, p. 9-10; F Rezaei et al, Towards understanding environmental and cumulative impacts of floating wind farms: Lessons learned from the fixed-bottom offshore wind farms. Ocean Coastal Management 243 2023; HELCOM-Baltic Earth 2024, Climate Change in the Baltic Sea. 2024 Fact Sheet. Baltic Sea Environment Proceedings n°198, p. 54; DNV 2024, Energinet – Marine Environmental Studies: Kriegers Flak II North & South – Fish populations and habitats. Report no.: 2023-4113, p. 21–24; E Albrecht, A Belinskij, and E Heikkilä, Policy coherence for ecosystem-based management: Implementing EU water and marine policies in the Archipelago Sea. 2025 (171) 106427 Marine Policy, p 6.

maritime space in the Baltic Sea, especially considering the high number of conflicting uses.[46] According to Neimane et al., a holistic multi-use approach has a lot of potential to balance resource and space sharing among various activities.[47] While offshore wind development is prioritised, the adoption of the multi-use principle remains cautious. In the long term, large-scale offshore renewable energy development and multi-use maritime space will play a key role in achieving the EU's and global sustainability goals by 2050.[48] In some cases, offshore wind farm structures have been observed to function as artificial reefs, providing habitats for various animal and plant species.[49] Such findings support the idea that OWE can serve multiple purposes simultaneously, and these intentional or unintended uses should be further supported. Identifying such opportunities during the planning stages of offshore wind farms is crucial when aiming to improve coherence between different policy sectors.

Increased research on the impacts of offshore wind energy on biodiversity would enhance evidence-based decision-making, particularly regarding the siting of offshore wind farms (and by extension SEAs, as they include a zoning assessment), thereby improving coherence between biodiversity protection and offshore wind development.[50]

Competition between OWE and aquaculture

The connection between OWE planning and aquaculture has not been studied extensively.[51]

Competition between offshore wind power and aquaculture will likely increase as offshore wind power expands significantly in the near future. This competition regarding marine space may result in coherence issues between these two uses.[52] Multi-use planning could be seen as a natural step forward toward more coherent integration of these maritime uses.[53] It would

[46] HELCOM-VASAB 2016, Guideline for the implementation of ecosystem-based approach in Maritime Spatial Planning (MSP) in the Baltic Sea area. Adopted by the 72nd meeting of VASAB CSPD/BSR on 8 June 2016 and approved by HELCOM HOD 50-2016 on 15-16 June 2016, p. 2; and WWF-Coalition Clean Baltic (CCB) 2023, Guidelines for Planning Offshore Renewable Energy in the Baltic Sea – Under the Amended Directive for Renewable Energy and the REPowerEU Plan. Summary Report 2023.

[47] L Neimane, L Ozolina, and D Saparniene, Maritime Multi-Use Approach in the Baltic Region: Offshore Wind Energy and Tourism Cases. (2021) International Scientific Conference on Economics and Entrepreneurship, SCEE' 2021 Proceedings.

[48] Ibid.

[49] M Reckermann et al, Human impacts and their interactions in the Baltic Sea region, Earth Syst. Dynam., 13, 1–80, p. 49; WWF-Coalition Clean Baltic (CCB) 2023, Guidelines for Planning Offshore Renewable Energy in the Baltic Sea – Under the Amended Directive for Renewable Energy and the REPowerEU Plan. Summary Report 2023, p. 21; DNV 2024, Energinet – Marine Environmental Studies: Kriegers Flak II North & South – Fish populations and habitats. Report no.: 2023-4113, p. 23-24; and E Albrecht, A Belinskij, and E Heikkilä, Policy coherence for ecosystem-based management: Implementing EU water and marine policies in the Archipelago Sea. 2025 (171) 106427 Marine Policy, p. 6.

[50] HELCOM Recommendation 34E/1: "Safeguarding important bird habitats and migration routes in the Baltic Sea from negative effects of wind and wave energy production at sea" (part of the 2013 HELCOM Ministerial Declaration); M Matczak, A Schultz-Zehden, and C Coornaert, Recommendations to the HELCOM-VASAB MSP working group on future actions deriving from findings from the Baltic LINes project 2019; Nordic Energy Research 2022, Accommodating Biodiversity in Nordic Offshore Wind Projects; WWF-Coalition Clean Baltic (CCB) 2023, Guidelines for Planning Offshore Renewable Energy in the Baltic Sea – Under the Amended Directive for Renewable Energy and the REPowerEU Plan. Summary Report 2023; P Vihavainen et al, Merituulivoiman edistäminen (Promoting offshore wind in Finland). Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 2024:4, p. 6 and 172.

[51] G van Hoey et al, Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021, p. 30 and 73-74

[52] Ibid, p. 16 and 32.

[53] Ibid, p. 69 and 73-80.

nonetheless face coherence issues as well. For example, long distances of offshore wind farms from the shore may render aquaculture economically unviable in a multi-use context without cross-sectoral cooperation.[54] However, offshore wind companies may not be interested in collaborating with aquaculture operators. The lack of clear permitting processes and regulatory uncertainties (e.g. the need of clearer licensing procedures) might also slow down the development of aquaculture in conjunction with offshore wind power.[55] Safety concerns can also be seen as a factor contributing to conflicts between OWE, aquaculture, and their simultaneous multi-use.[56] These concerns include *inter alia* increased collision risks due to overlapping operations and unclear responsibilities for safety management and liability.

Several options have been identified to improve the coherence between aquaculture policies and OWE planning. One example is early and **comprehensive dialogue between various stakeholders**, such as aquaculture operators, wind power companies and national authorities. This would apply, for example, to various requirements related to regulation and licensing. This dialogue should continue throughout the entire wind power planning process.[57] In a multi-use context, early integration of aquaculture with OWE planning could reduce aquaculture operational costs by enabling synergies in infrastructure and logistics, although such benefits depend on site conditions and governance arrangements.[58] Another factor that could enhance policy coherence is the generation of new research data. New knowledge (such as data on how offshore wind farms affect local hydrodynamics, sedimentation, and habitat conditions) could potentially improve our ability to design offshore wind power areas more suitable for multi-use.[59]

In addition to implementing multi-use approaches, more extensive stakeholder involvement in OWE planning and supporting research programs on the sustainable design of offshore wind farms, platforms like the Baltic LINes' BASEMAPS should be more widely used to share spatial data, identify conflicts, and improve decision-making. MSP is, in principle, an effective instrument for fostering coherence. However, the integration of the ecosystem approach and strategic impact assessments in MSP needs to be improved. Currently, the methodological and administrative criteria for strategic environmental impact assessment (SEIAs) in the context of MSP are ambiguous. The ambiguity stems from the absence of a shared methodology for applying these so-called "strategic environmental impacts" in the context of MSP, resulting in

[54] Ibid, p. 19-20 and 48.
[55] Ibid, p. 20-22 and 69.
[56] ED Christensen et al, Go offshore -Combining food and energy production. Technical University of Denmark. Department of Mechanical Engineering 2015, p. 30.
[57] ED Christensen et al, Go offshore -Combining food and energy production. Technical University of Denmark. Department of Mechanical Engineering 2015, p. 33; G van Hoey et al, Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021, p. 3, 48, 76 and 78; and HELCOM-VASAB 2021, Regional Maritime Spatial Planning Roadmap 2021-2030, p. 55.
[58] ED Christensen et al, Go offshore -Combining food and energy production. Technical University of Denmark. Department of Mechanical Engineering 2015, p. 8; and G van Hoey et al, Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021, p. 16–17, 66 and 75–76.
[59] COM(2020) 741 final., Comuunication from the Commission to the European Parliament, the Council, the European Economic and Scoial Committee and the Committee of the Regions. An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future., p. 10; and G van Hoey et al, Overview of the effects of offshore wind farms on fisheries and aquaculture, Publications Office of the European Union, Luxembourg, 2021, p. 73–80.

fragmented national practices and no clear mechanisms for incorporating SEIA findings into planning decisions.

In a nutshell, **the policy instruments set for the implementation of sectoral policies in OWE planning in the Baltic Sea region can be considered to partially internalise the key requirements of EU policies** aimed at delivering healthy marine ecosystems. For example, the HELCOM-VASAB MSP Roadmap and the Baltic LINes project incorporate references to ecosystem-based approaches, environmental protection, and cross-border coordination in relation to OWE, reflecting a degree of formal alignment with EU environmental law. However, this internalisation remains insufficient when assessed against the specific ecological challenges posed by the rapid expansion of OWE in the Baltic Sea. In particular, mechanisms to guide strategic and cumulative environmental impact assessments are underdeveloped, and cross-sectoral dialogue in the early-planning phase was found to be not ideal. As a result, **while sectoral policy instruments for OWE planning increasingly reflect the ambitions of the EU directives and the EGD, they do not yet adequately structure planning processes** to ensure that offshore wind development is fully compatible with the protection and restoration of healthy marine ecosystems.

4.3.2 Offshore wind energy in the Norwegian North Sea

As a member of the European Economic Area, significant parts of Norwegian policies align with EU energy policies. Norway also supports EGD objectives through strategic cooperation, including a formal Green Alliance with the EU. In the case of renewable energy, RED I (2009) was incorporated into the EEA Agreement in 2011 and has been fully implemented into Norwegian law, while RED II is currently being transposed. Norway has not taken steps to implement RED III.

The **Offshore Energy Act** and its associated regulations are the cornerstone of Norway's offshore wind energy governance. The Offshore Energy Act stipulates that before the government can open areas for offshore wind energy production, a Strategic Environmental Assessment (SEA) must be conducted. The Offshore Energy Regulations provide detailed guidelines for the licensing process.

SEAs are conducted before any areas can be opened for offshore wind energy production. These assessments evaluate the consequences of windfarms in areas that are identified as potentially suitable for offshore wind energy, and aim to integrate biodiversity and environmental values from the outset. However, these assessments are very broad in scope, and also include infrastructure, costs, social and economic impacts, etc. By providing detailed information and identifying knowledge gaps, SEAs help to inform decision-making and promote adaptive management.

The organization of SEAs in Norway is a collaborative effort involving multiple agencies and expert institutions. The Norwegian Water Resources and Energy Directorate (NVE) coordinates the SEA processes. The SEA process is divided into 22 specific topics, each assessed by different institutions. These topics include:

- Environmental Impacts: Seabirds and migratory birds, benthic communities and habitats, pelagic biodiversity.
- Impacts on other sectors: Fisheries, offshore aquaculture, business and tourism, shipping, petroleum, defence,

- Technical, infrastructure, regulatory aspects: harbors, energy systems and grid connection, radar, electronic communication, air traffic, and more.

Prior to the SEAs, a directorate group has identified 20 potentially suitable areas for offshore wind energy development. This is followed by the preparation of a SEA program, which outlines the scope and methodology for the assessments. The background reports for the SEAs are produced by public institutions and external organizations, with regular updates and quality assurance provided by a reference group and NVE.

Once the assessments are completed, they undergo a public consultation procedure. This allows stakeholders, including environmental organizations, industry representatives, and the general public, to provide input and feedback on the proposed projects

SEAs contribute to achieving policy coherence by enhancing coordination among different agencies and stakeholders. They provide a comprehensive knowledge base that helps to align offshore wind energy policies with broader environmental and biodiversity objectives:

- **Comprehensive assessments:** Norway has a strong focus on knowledge-based marine governance, which is reflected in the SEA processes. In total, the SEAs for offshore wind areas are based on 22 background reports developed by relevant public institutions and external expert agencies. They cover a wide range of topics, including three reports on environmental impacts (above the water, in the water column, and on the seabed). Other reports cover consequences for other sectors, and technical and economic suitability. This way of organizing the process ensures that detailed knowledge is developed as a foundation for policy decisions. The SEAs also emphasize uncertainties and knowledge gaps, allowing for informed decision-making and adaptive management. This comprehensiveness is both a strength and a pitfall (see below).
- **Collaborative efforts:** The SEA process involves collaborative efforts among various agencies and stakeholders, enhancing the coherence and integration of assessments. While coordinated by NVE, different directorates are involved and have the chance to influence the process.

However, **challenges remain, for example in fully integrating SEAs with Norway's integrated management frameworks and addressing cumulative and transboundary impacts**. The assessments are often fragmented, with each area and topic evaluated separately, making it difficult to synthesize information and understand the overall impacts of multiple projects:

- **Fragmentation of knowledge and fata:** The assessments are conducted by different institutions, leading to difficulties in synthesizing information and understanding cumulative impacts.
- **Lack of standardized methodologies:** one of the challenges in the SEA process is the difficulty in conducting cumulative and transboundary assessments. The area-wise approach, where each identified area is assessed separately, leads to fragmentation of knowledge and data. This fragmentation makes it challenging to understand the

cumulative impacts of multiple offshore wind projects over time and across different regions.

- **Limited guidance on mitigation hierarchy:** The existing guidelines provide limited direction on how to apply the mitigation hierarchy (avoidance, mitigation, restoration, and offsetting) in the context of offshore wind development.

Norway has not implemented the MSPD and the MSFD, while the WFD is of limited relevance for this offshore case study. Instead of marine spatial plans, Norway uses integrated management plans that aim to ensure the sustainable use of marine resources while maintaining the health and productivity of marine ecosystems. As an alternative to the MSFD, Norway relies on a comprehensive monitoring system under this integrated management plan framework, which includes continuous monitoring of marine environments to assess and maintain good environmental status.

Norway's regulatory framework for offshore wind energy, including the Offshore Energy Act and associated regulations, provides a structured approach to licensing and environmental assessments. SEAs play a crucial role in balancing offshore wind energy development with environmental and biodiversity objectives. They are mandated by the Offshore Energy Act and are conducted before opening areas for offshore wind energy production. This process ensures that environmental impacts are considered early in the planning stages. However, **the alignment with the EGD objectives could be enhanced by addressing cumulative and transboundary impacts more effectively and by systematically integrating the mitigation hierarchy into planning processes.**

While the SEAs in the Dutch and German context are an integrated part of the MSP processes, in Norway, there is only a partial alignment with the ecosystem-based, integrated management frameworks. While the plans identify valuable and vulnerable areas, these are not protected areas, and they do not impose direct restrictions on activities like offshore wind development. Norway has not implemented a legal framework for establishing MPAs beyond its territorial waters. While the Nature Diversity Act allows for the designation of MPAs within territorial waters, there is no equivalent legislation for areas outside the territorial zone. The current gap limits the ability to protect biodiversity in offshore areas, which are crucial for maintaining healthy marine ecosystems. However, a proposed Marine Protection Act in Norway is currently under consideration by the Stortinget (Norwegian Parliament). The proposed Marine Protection Act represents a step towards comprehensive marine conservation in Norway, addressing gaps in the current legal framework and aligning with international conservation targets.

4.3.3 Offshore wind energy in the Dutch North Sea

The integration of EGD energy/climate and environmental objectives in the legal, regulatory and institutional arrangements governing planning of offshore wind farms

The policy instruments designed to implement sectoral objectives in the Dutch North Sea demonstrate a formal and practical internalization of key environmental requirements derived from the MSFD, WFD, and MSPD. The North Sea Programme 2022–2027 explicitly operationalises the ecosystem-based approach mandated by the MSFD and MSPD. It strategically aligns ambitious offshore wind expansion goals with stringent environmental

safeguards by identifying wind development zones through a rigorous, ecologically informed funneling process. Sensitive habitats and protected areas under Natura 2000 and MSFD marine protected zones are proactively excluded, evidencing a precautionary alignment with EU biodiversity legislation. Moreover, the Programme integrates MSFD-driven goals such as achieving Good Environmental Status (GES) by embedding marine biodiversity and ecological carrying capacity as explicit preconditions for energy infrastructure development.

The Netherlands' offshore wind strategy in the North Sea exemplifies how energy and environmental goals under the EGD can be actively integrated through legal, regulatory, and institutional design. With national targets set at 21 GW by 2032, 50 GW by 2040, and 70 GW by 2050, offshore wind development is central to the country's climate and energy transition. However, this expansion is firmly embedded within a policy framework that simultaneously emphasizes the protection and restoration of the marine ecosystem. Relevant policy instruments explicitly stress that achieving renewable energy targets must not compromise the ecological integrity of the North Sea.

Central to this integration is the Dutch MSP system, particularly the North Sea Programme 2022–2027, which embodies an ecosystem-based approach, in compliance with Directive 2014/89/EU (MSPD). This strategic plan maps future uses of the Dutch Exclusive Economic Zone and delineates offshore wind zones alongside marine protected areas, sustainable fisheries, and ecological recovery zones. A phased "funneling" process guided spatial allocation: environmentally sensitive areas, including Natura 2000 and MSFD zones, were excluded at the outset, reflecting a precautionary stance that goes beyond practices in neighboring states. Additional filters considered shipping, defense, and grid connectivity needs, while stakeholder engagement, for instance, via the North Sea Consultation, ensured socio-ecological trade-offs were addressed through consultations.

The SEA conducted for the North Sea Programme served to confirm pre-selected choices, raising some concern over its limited influence on early spatial decisions. Nonetheless, it informed mitigation measures and underscored key knowledge gaps. Planning is further anchored in the precautionary principle and the requirement to maintain Good Environmental Status under the MSFD. Offshore wind deployment is therefore paced and conditional: while zones allow for up to 16.7 GW additional capacity, only around 10.7 GW additional installed capacity will be operational by 2032, with future developments subject to ecological monitoring. The relevant background studies indicate that while much of the ecosystem can tolerate this level of wind energy, certain vulnerable species, such as herring gulls and harbour porpoises, may require additional safeguards as expansion continues.

A key institutional strength lies in the governance architecture. The Interdepartmental Directors' Consultation North Sea (IDON) brings together ministries responsible for climate, infrastructure, and biodiversity, ensuring cross-sectoral alignment. Simultaneously, the North Sea Consultation, an institutionalized stakeholder forum, produced the North Sea Agreement. This agreement between the government and stakeholders has put the basis for spatial trade-offs, such as identifying new wind energy search areas alongside conservation zones, and even established a Transition Fund to support sectors affected by the ongoing energy transition, such as fisheries. This consensus-based governance approach has fostered both public legitimacy

and procedural stability, reinforcing the policy motto that "a wind farm is never just a wind farm", but a vehicle for broader environmental and socio-economic outcomes.

Beyond avoiding harm, Dutch MSP encourages nature enhancement and multi-use innovation. The North Sea Programme aligns with MSFD goals by promoting ecological restoration through artificial reefs, oyster beds, and habitat complexity built into wind infrastructure. Each wind zone is accompanied by an "area passport" outlining possibilities for co-use with aquaculture or marine sanctuaries. Pilot projects are exploring seaweed farming within turbine arrays and turbine-free corridors to support marine life. These initiatives support the EGD's call for a sustainable blue economy, proving that offshore wind can generate ecological co-benefits alongside clean energy.

In sum, **Dutch offshore wind planning showcases a deliberate balancing act between scaling up renewables and preserving marine ecosystems**. By integrating biodiversity considerations from the outset, through site exclusions, phased build-out, stakeholder-led trade-offs, and nature-positive design, the Netherlands reduces potential for conflict while enhancing implementation certainty. This model offers valuable lessons: early-stage integration of environmental conditions can streamline permitting; adaptive phasing aligned with ecological thresholds supports long-term resilience; and coordinated, consensus-driven governance creates legitimacy and coherence. **As the EU accelerates offshore wind under the EGD, the Dutch case underscores that MSP, when conducted holistically, is a powerful tool for aligning climate ambition with marine protection**. Other Member States would benefit from adopting similar integrative, forward-looking approaches.

The integration and balance of competing objectives in the legal, regulatory and institutional arrangements governing the process of authorization of offshore wind farms

Further reinforcing the internalization of EU water and marine directives, the Dutch legal framework, particularly through the Offshore Wind Energy Act and associated Kavelbesluiten (parcelling decisions), embeds environmental conditions directly into offshore wind permits. These conditions include noise limits during turbine construction, operational restrictions such as seasonal curtailments to protect migrating birds and marine mammals, and mandatory implementation of nature-inclusive design elements like reef habitats integrated into turbine foundations. Recent wind farm tenders, notably Nederwiek I-A and IJmuiden Ver Gamma A and B, explicitly incorporate non-economic, nature-related criteria into their selection processes, rewarding developers who commit to ecological enhancements beyond mere mitigation. Such criteria represent a clear translation of EU marine ecosystem protection objectives into operational tendering procedures, encouraging industry innovation and accountability in environmental stewardship.

The Dutch offshore wind authorization framework represents a rather advanced, integrated system designed to align rapid renewable energy deployment with strong environmental safeguards. Reformed through the Offshore Wind Energy Act in 2015 (amended in 2021), the regime replaced a developer-led, bureaucratic permitting model with a centrally coordinated, state-led process. This shift, motivated by the urgency of meeting EGD energy targets, embeds environmental protection at the heart of wind farm approval and is now

regarded as a best practice by the EU Commission (at least when it comes to the one-stop-shop approach).

A cornerstone of the system is the parcelling decision (*kavelbesluit*), a combined spatial and environmental consent issued by the authorities for each wind farm site within pre-designated zones. These decisions fix project parameters, including location, size, and key operational conditions, and are based on prior government-led assessments, including Environmental Impact Assessments (EIAs), Natura 2000 appropriate assessments, and technical surveys. By assuming responsibility for these studies and coordinating grid connections via the TenneT operator, the Dutch state reduces the risks for developers and accelerates deployment. This front-loading of environmental assessments ensures that tendered sites already comply with legal obligations under the MSFD and the Nature Directives. Furthermore, the adopted "one-stop-shop" model, where environmental, spatial, and infrastructure approvals are integrated, both streamlines the process and ensures early consideration of ecological limitations.

Crucially, **environmental conditions are embedded directly into wind permits, transforming high-level conservation principles into enforceable obligations**. These include site-specific noise limits, seasonal restrictions on pile driving to protect marine fauna, and turbine curtailment protocols during bird migration events. The latter innovation, relying on radar-based forecasts and coordinated through ministerial decisions, illustrates the adaptive management approach underpinning Dutch permitting. It ensures that energy production can be modulated in real-time to mitigate wildlife impacts, with TenneT, the energy regulator, consulted to safeguard energy security.

Another key feature is the requirement for "nature-inclusive design" (NID), reinforced by the comparative tendering process, in which bidders are awarded based not only on price but increasingly on ecological and innovative performance criteria (see tender for Hollandse Kust West VII). Recent tenders have mandated that turbine foundations, scour protections, and seabed interventions incorporate features beneficial to marine biodiversity, transforming industrial infrastructure into artificial reef habitats. These NID measures go beyond mitigation, aiming for ecological enhancement. Furthermore, under the comparative tendering system, developers receive competitive advantage for proposing innovative biodiversity measures. This market-based incentive has stimulated creative solutions, such as combining wind farms with floating solar or seaweed aquaculture, aligning ambitions about biodiversity enhancement with economic competition.

Legal coherence is another strength. Under the Offshore Wind Energy Act, all necessary environmental approvals, including Natura 2000 assessments, are consolidated into the parcelling decision, eliminating redundant permitting tracks. Exemptions for incidental species disturbance are issued within this same process, conditional on robust scientific justification and mitigation. This avoids legal fragmentation and supports the EU Renewable Energy Directive's mandate for permitting simplification. So far, this integrated model has proven resilient: few legal challenges to offshore wind permits have succeeded, in part due to the comprehensive environmental conditions and limited procedural standing for appeals.

The Dutch system also places **strong emphasis on post-permit monitoring and adaptation**. Programs like the Wind op Zee Ecologisch Programma (WoZEP) and MONS collect data on bird strikes, noise effects, and habitat changes, feeding results back into policy. The Offshore Wind Energy Act allows permits and species exemptions to be revised if actual impacts diverge

from predictions, ensuring ongoing alignment with the precautionary principle. This adaptive capacity is essential as wind capacity expands, particularly in managing cumulative effects on marine ecosystems.

However, as offshore wind accelerates under the RED III acceleration mechanisms, **concerns arise over the potential dilution of environmental scrutiny during the authorization process**. Stakeholder groups, notably Stichting de Noordzee, have flagged that while current Dutch tenders remain robust, future pressure to meet 2030 targets could test the resilience of this integrated system

Overall, the Dutch offshore wind authorization regime is a prime example of how regulatory streamlining and environmental integration can be mutually reinforcing. By embedding ecological considerations into site selection, permit design, tendering, and enforcement, the Netherlands has created a flexible yet rigorous framework. Other jurisdictions can draw valuable lessons: the importance of state-led coordination, integrated permitting, adaptive conditions, and biodiversity-related competition during tender procedures. **A forward-looking policy recommendation would be to expand nature-positive obligations, for example, by requiring each new wind farm to contribute to a marine restoration fund or to deliver quantifiable biodiversity gains.**

4.3.4 Offshore wind energy in the German North Sea

Germany's governance structures, SPSIs, and stakeholder engagement mechanisms influence the coherence between offshore wind energy expansion and marine biodiversity conservation objectives.

Governance structures

Germany's governance structures play a central role in shaping the coherence between offshore wind energy expansion and marine biodiversity conservation. Responsibilities are divided across ministries and agencies, which creates coordination challenges. The Federal Ministry for Digital and Transport (BMDV) oversees the Federal Maritime and Hydrographic Agency (BSH), which holds substantial authority over maritime spatial planning (MSP), the Site Development Plan, and offshore wind site designation. In contrast, the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), through its scientific agency BfN, is responsible for biodiversity conservation. However, BfN has an advisory role with no formal decision-making power, which limits its ability to shape spatial planning outcomes (Interview, 2024).

This institutional fragmentation can lead to policy silos, where offshore wind expansion is prioritized over biodiversity objectives (Interview, 2024; Gee et al., 2024). While formal consultations between BSH and BfN take place during SEAs and MSP revisions, there are no joint decision-making platforms. This separation of mandates hinders early and effective integration of biodiversity concerns.

Science-policy-society interfaces

The science-policy-society interface in Germany demonstrates notable advancements but continues to face significant challenges. Environmental data is generated by entities like the BSH, BfN, and offshore wind developers. However, access to this information is inconsistent, with proprietary datasets from developers often remaining unavailable to broader stakeholders,

hindering robust knowledge transfer mechanisms. While public consultations exist regarding MSP, SEAs and EIAs, doubts persist about whether stakeholder feedback is effectively integrated into final decision-making processes. Assessment tools for cumulative impacts remain underdeveloped, limiting the capacity to evaluate ecosystem-wide changes.

Political priorities, such as meeting the 70 GW offshore wind capacity target by 2045, frequently overshadow scientific evidence, weakening the integration of scientific recommendations into policy decisions. Strengthening knowledge transfer platforms, adopting advanced assessment tools, and allocating adequate resources will be critical to bridging these gaps, ensuring policy coherence, and balancing offshore wind expansion with biodiversity conservation in alignment with EGD objectives.

Stakeholder engagement

Stakeholder involvement is formally ensured through consultation mechanisms, but its adequacy and efficiency are questioned. Representation remains imbalanced, with environmental NGOs perceiving limited influence compared to industry stakeholders. The geographical scale of EEZ projects constrains broader public engagement, reducing transparency and legitimacy. Power imbalances favour energy objectives over biodiversity concerns, while mechanisms to address conflicting interests are present but inconsistently applied. Resource allocation is not fully aligned with outputs, and stakeholders argue that processes are insufficiently fair or legitimate, especially for biodiversity advocates.

SEAs in Germany – Are they fit to support coherence and cross-compliance between multiple policy objectives?

SEAs are designed to integrate biodiversity considerations into offshore wind planning, but their effectiveness in supporting policy coherence and cross-compliance remains constrained.

SEAs are mandated under the SEA Directive (2001/42/EC) and transposed into German law via the UVPG, requiring assessments for plans with significant environmental effects. While SEAs can support the consideration of biodiversity objectives (e.g., MSFD, Birds and Habitats Directives) and provide a link to climate and energy targets (e.g., RED III), their formal influence over reconciling these objectives remains limited. . The ‘overriding public interest’ status of offshore wind under WindSeeG and EEG accelerates approvals, which might reduce the influence of SEA findings in shaping site selection especially when cojnflicts arise. The Renewables Acceleration Areas (RED III) further streamline permitting, limiting environmental assessments in these zones. SEAs assess strategic-level impacts, but their capacity to evaluate cumulative effects is insufficient, particularly given the 70 GW offshore wind target. Institutional fragmentation also affects implementation, as BSH leads SEAs, while BfN’s influence is limited (Interview, 2024). While stakeholder consultations occur, transparency on how biodiversity concerns are integrated remains unclear. **Strengthening cumulative impact assessments, transboundary coordination, and biodiversity integration within SEAs would improve their effectiveness in supporting GD 2030 and 2050 objectives.**

SEAs in Germany’s EEZ primarily focus on identifying environmental risks and integrating mitigation measures rather than relocating offshore wind farms or

establishing biodiversity corridors. They prioritize reducing pressures from wind farms by requiring mitigation measures, such as low-noise construction techniques and seasonal restrictions to protect marine species. **Compensatory measures for biodiversity impacts are considered but are not systematically applied**. SEAs also acknowledge cumulative impacts, but their effectiveness in addressing long-term ecosystem changes remains limited.

SEAs, but also other policy instruments such as EIAs, as well as MSP instruments like the Site Developmnet Plan (SDP), provide mechanisms for integrating biodiversity considerations into offshore wind energy planning, but their effectiveness in ensuring policy coherence is limited. SEAs and EIAs help assess environmental impacts but often lack comprehensive cumulative and transboundary assessments, reducing their ability to fully balance energy and biodiversity objectives. MSP establishes spatial frameworks for marine activities, but biodiversity goals are often secondary to energy priorities, and coordination between responsible agencies remains fragmented. **Strengthening cross-sectoral integration and improving cumulative impact assessments could enhance policy coherence.**

Germany's policy instruments, including SEAs, EIAs, and MSP, aim to integrate environmental considerations into offshore wind energy planning while aligning with key EU policies such as the MSFD, WFD, and MSPD. However, **their implementation presents challenges in fully internalising the requirements necessary to ensure the protection of marine ecosystems.** The SEA and EIA, transposed into German law through the UVPG, are intended to assess environmental impacts at both strategic and project levels. While these assessments contribute to identifying risks and mitigation measures, their effectiveness in addressing cumulative and transboundary impacts has been questioned. Spatial and temporal mismatches between energy expansion goals and biodiversity objectives further hinder coherence. The MSP process, led by the BSH, seeks to balance multiple maritime uses, including offshore wind and environmental protection. However, biodiversity objectives are often treated as constraints rather than fully integrated priorities. Renewables Acceleration Areas under RED III streamline permitting but allow exemptions from full EIAs, raising concerns about the adequacy of biodiversity safeguards.

The policy instruments governing offshore wind energy expansion and biodiversity conservation, such as the SDP, Renewable Acceleration Areas (RAAs), SEAs, EIAs, and MSP, are designed to support Germany's renewable energy and biodiversity goals. However, their implementation reveals **tensions and challenges in achieving full alignment with the GD objectives.** The SDP designates areas for offshore wind energy development to meet Germany's renewable energy targets, operating within the broader MSP framework. The 2023 update aligns with increased offshore wind capacity targets but also seeks to integrate offshore wind farm development with grid infrastructure planning. RAAs aim to accelerate project approvals by exempting certain environmental assessments under specific conditions, raising concerns among stakeholders about potential biodiversity trade-offs.

4.3.5 Offshore wind energy in the French Mediterranean

Offshore wind farms could have potential positive impacts on climate change and biodiversity protection (reserve effect/reef effect) but also have a negative biodiversity effect through contamination (electromagnetic wave, noise, and chemicals).

On the French Mediterranean region, the offshore wind farm sector has an indicator linking environmental stakes and economic pressures in the "Objective indicators" annex of the Façade Strategic Document (MSFD/MSPD) (see D3.2 question 3). It has been recommended that part of the OWE levy should be devoted to the implementation of the French Mediterranean Sea's programme of measures[60]. However, a first call for project has been launched using this tax and was only focused on scientific research regarding the impacts of the offshore wind farms on biodiversity. This tax consequently supports biodiversity protection through knowledge production, but not yet by concrete biodiversity conservation measures. Conversely, **except for the mention that offshore wind energy must comply with the** French Mediterranean Sea program of measures **requirements, no explicit cross-references of its objectives within the French energy strategy[61] was found.** In practice, in their strategic definition and writing of the French Mediterranean Sea program of measures and offshore wind national policies and strategies, there are always links that are established and they must be coherent. to facilitate this coherence, offshore wind is mixed with the elaboration of the new façade French Mediterranean Sea program of measures in the 2023-2024 public debate. At the regional operational scale, very few synergies are built even though institutions are working together.

Offshore wind energy strategies and policy (such as the national law to accelerate the production of renewable energies of the 10th of March 2023) are mostly dedicated to achieving carbon neutrality by 2050 and to keep national sovereignty on energy production. Thus, **offshore wind farms now play a central role on the marine stage in France and more specifically in marine spatial planning.** This national enthusiasm for offshore wind energy impacts decision-making: authorisations are granted despite fewer environmental requirements than those required by the environmental law and therefore less verification of consistency with the requirements of MSFD, MSPD, and WFD.

One specificity from the French OWE governance system is that the Façade Strategic Document also corresponds to the SEA for a given maritime façade. However, given the fast acceleration of offshore wind energy development, the Façade Strategic Document for the Mediterranean coast, drafted in 2017, has shown limitations. At the time of its adoption in 2018, the French Energy Plan Decree (adopted in 2019) was still in preparation, resulting in the targets not being specified in the strategic objectives. Given that the regulatory obligations for SEA are described in the DSF, they did not incorporate the zoning required to meet the objectives of the French Energy Plan relating to marine renewable energy with sufficient detail. SEAs have therefore been unable to completely integrate the impacts of the offshore wind

[60] National Council of the Sea and Coastlines , Notice on the Facade Strategic Documents, 12 of July 2021.

[61] The French offshore wind energy strategy is very wide. It includes in a non-exhaustive list:

- the "Pacte sur l'éolien en mer" (between the State and private companies), the State confirms its commitment to the ambitious deployment of offshore wind power off the French coast, with a target of 2GW/year from 2025 and 40GW installed by 2050. The industry is committed to quadrupling the number of direct and indirect jobs linked to offshore wind power by 2035, to committing more than €40 billion in investment over the next 15 years and to achieving 50% local content in projects.
- Publically announced measured by the French government (interesting fact: it always the ministry of economy and not the ministry of environment)
- Different laws such as the APER law of March 2023

energy development from the French Energy programming, nor the cumulative impacts with those of other activities.

An example of the difficulty to reconciliate environmental matters with the development of offshore wind farms in France can be found in the Strategic Façade Document (MSFD and MSPD). This document has undergone a wide debate in France (November 2023-April 2024) that aimed at gathering feedbacks from local stakeholders to draft the future Façade Strategic Document cycle. For this debate, elements of the Façade Strategic Document (environment and MSP) have been mixed with the offshore energy debates, **lowering the environmental aspect of the debate but enhancing potential coherence**, with both strategy/policies being constructed at the same time. It can be noted that the emphasis on the offshore wind energy topic lowers the space given to fisheries in the debate with potential lesser inclusion of fisheries matters in the future marine spatial planning.

Box 2: An example of the difficulty to conciliate environmental matters with the development of offshore wind farms in France

The permitting process for the construction of an offshore wind farm and its connection facilities (connected buildings, electric cables) is also a challenge to deliver healthy marine ecosystems. It requires administrative authorisations to be obtained by the successful bidder for the offshore wind farm, and by the national company of electricity RTE for the farm-sea connection, including the offshore substation. The nature of the authorisations required for the offshore wind farm depends on whether the project is located in the public maritime domain or in the EEZ. In the first case, the offshore wind farm developer and RTE must each obtain an environmental authorisation and a concession for use of the public maritime domain by the local representative of the State (Departmental Prefect). In the EEZ, the developer and RTE each have a single concession to obtain (RED III accelerated procedure) and do not need an environmental authorisation anymore. The authorisation is issued by the Maritime Prefect. In both cases, following recommendations from the national Environmental authority is advisory, but not mandatory.

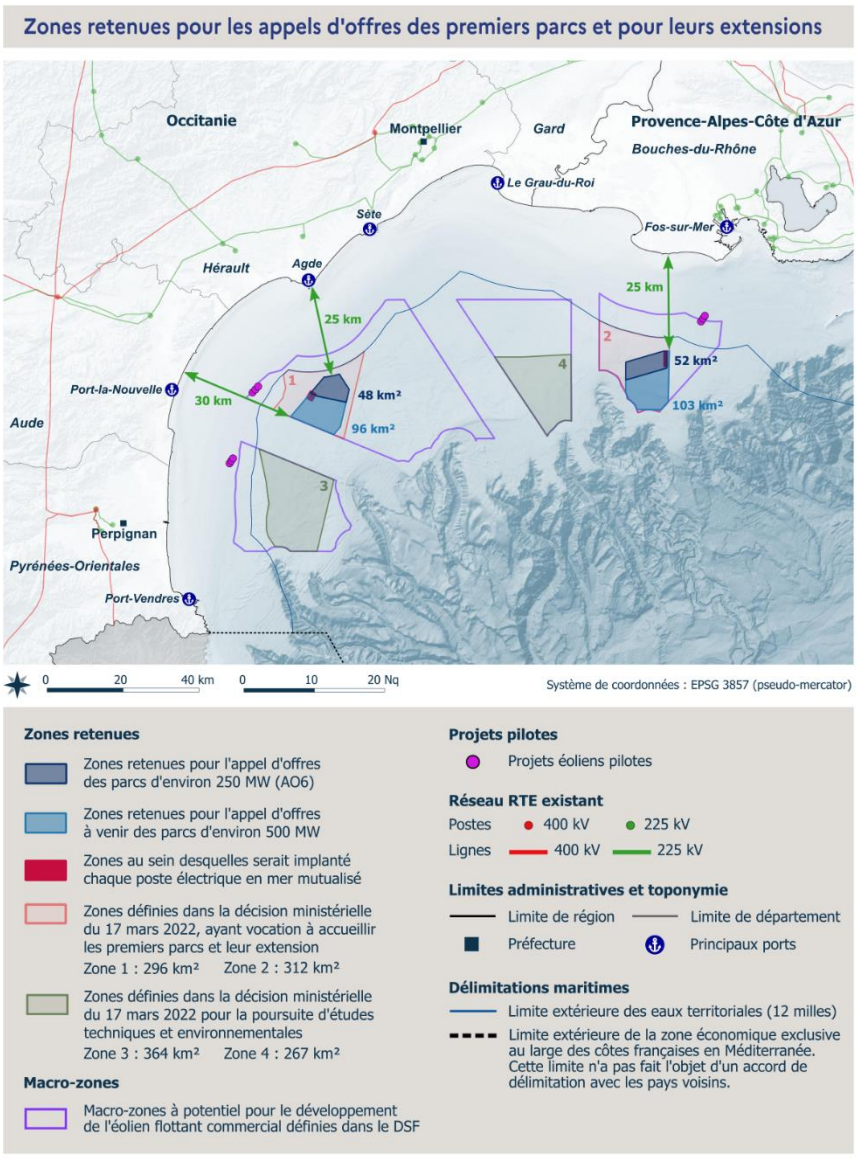

Figure 17: Areas selected for tenders for the first wind farms and their extension into the French Mediterranean region (source: Offshore wind observatory).

For the past two years, most of the delivery mechanisms related to the offshore wind energy sector were dedicated to:

- **communication**: a strong communication has been developed by the French government to get the public acceptance[62].
- **funding science**: in 2022, an observatory of offshore wind energy was created. About 300 million euros of research has been supported on offshore wind to understand the potential positive and negative impacts of building such infrastructure. Before that,

[62] A meeting organised in July 2023 in the city of Marseille about the new offshore wind farm that will be built close from there (Fos-sur-Mer) shows that there is no consensus in the population, especially among fishermen. In November 2023, to reassure fishermen, the President of the Republic E. Macron made a speech explaining that 30% of the offshore wind energy taxes will be dedicated to supporting the fishing industry (source: Youtube video of the public debate from the 12th of July 2023 in Marseille https://www.youtube.com/watch?v=Q02A53-17ZY; Minutes of the meeting: 12th of July 2023 in Marseille, 9th of November 2022 in Marseille, 1 Décembre 2022 Canet en Rousillon, 5th of December 2022 in Narbonne. Those minutes can be shared with CrossGov Task leaders.

the only study[63] funded was financed by the public company RTE (the main company involved in offshore wind infrastructure construction) and led by "France énergie marine" (public-private partnership) and the IFREMER (National institute of Marine Science), which came to the conclusion that offshore wind farms have no harmful consequences on the environment. Some scientists protested against this study, criticising the objectivity of the results. Indeed, the RTE study concluded that there was no effect from the commissioning of these farms on marine ecosystems, despite the electromagnetic fields. The conclusions of other laboratory studies[64] carried out by scientists were the opposite.

- **carrying environmental impact assessment for project development**: the avoid-reduce-compensation procedure[65] (see D3.2 for more information) must be led carefully in the future to mitigate the impact of structures such as wind farms. However, a question of competency remains because most of these wind farms energy will be built beyond the maritime public domain, where only the Maritime Prefect[i] '(representative of the French State and French Prime Ministry at sea) has competencies and could easily grant derogations that run counter to the protection of biodiversity.

Offshore wind energy policies are closely related to marine spatial planning (MSPD) but there is still room for improvement to internalize ecosystem protection in fundings and authorizations. Despite improvements and attempts to better connect sectoral policies such as offshore wind energy with MSFD, ecosystem protection is not well internalized and mostly remains at the communication stage (e.g. research and communication on the reef effect of offshore wind energy). No element was found on the internalisation of WFD into the offshore wind farm sector.

Regarding the three Green Deal objectives, policy instruments can lead to contradictory effects:

- Climate resilience: **building offshore wind energy farms can have long-term positive impacts.** The French law on accelerating the production of renewable energies (March 2023[66]) aims at constructing 50 offshore wind farms in France to achieve carbon neutrality in 2050. Among them only four will be in the Mediterranean Sea.

[63] https://www.france-energies-marines.org/wp-content/uploads/2021/05/rapport-synthese-species-FR-BD.pdf
[64] Harsanyia P and all, the Effects of Anthropogenic Electromagnetic Fields (EMF) on the Early Development of Two Commercially Important Crustaceans, European Lobster, *Homarus gammarus* (L.) and Edible Crab, *Cancer pagurus* (L.). *J. Mar. Sci. Eng.* 2022
[65] The **ERC sequence** (avoid-reduce-compensation) is the main guidance to avoid damaging the environment. It aims at reconciling economic development and environmental issues, by providing a guideline for integrating the environment into planning documents and regional development projects. When a project at sea is instructed, first, the company must try to avoid damaging the environment, if not, to reduce its impact and if none of the two options before it is possible, to compensate by investing in environmental-friendly projects. It is a mix of legal instruments (mandatory), economic instrument (taxes and compensation), compliance procedure (reporting) and information (environmental assessment).
[66] LOI n° 2023-175 du 10 mars 2023 relative à l'accélération de la production d'énergies renouvelables called APER

- Biodiversity protection: **almost no funding is dedicated to biodiversity protection through effective measures in the offshore wind energy sector.** Funds rather focus on developing research activities to create an ecological inventory through the French OWE Green Fund (Fond Vert[67]). There are no financial incentives to protect biodiversity and only regulatory mechanisms prevent biodiversity damages (i.e. EIA and authorisations). The EIA analysis studied in the French Mediterranean case study shows mitigation measures, but they are not described in detail they are only considered as second-order priorities (only compensation measures and no avoidance measures).

To achieve the objectives of the EGD, particularly with regards to the protection of biodiversity, it is essential to pay attention to the pace of development of offshore wind projects. Because of the lack of data, the authorisation system may risk favouring this sector over biodiversity. Synergies must be found with existing planning tools derived from MSFD and MSPD to ensure the effectiveness of the authorisation procedure, and there must be continued investment in scientific research into the areas around wind farms to understand the cumulative impacts they add to the environment.

[67] Green Fund to accelerate ecological transition in territories (Fond vert pour accélérer la transition écologique dans les territoires : https://www.ecologie.gouv.fr/fonds-vert)

5. Carrying out a cross-case study analysis to answer Task 3.3 research questions

5.1 Q1: Do policy instruments set for the implementation of sectoral policies adequately internalize key-requirements of EU policies established to deliver healthy marine ecosystems (MSFD/WFD/MSPD)?

Concerning the **agricultural sector**, the first data available from the Finnish case study shows that in Finland, the latest national plan for implementing the CAP does take into account environmental requirements. However, this is probably **not sufficient** to ensure the effective implementation of the environmentally-friendly practices required to achieve healthy marine ecosystems, and hence the respect of the WFD, MSFD, and MSPD objectives.

With regards to **aquaculture and fisheries**, proposed instruments and in particular the new/current EMFAF funding do consider biodiversity protection and the environmental objectives of the MSFD. While this can be considered as an improvement, compared to the previous EMFAF cycle, the evidence collected show that it is not sufficient to deliver the required impact (as discussed in the Finnish Archipelago Sea, the French Mediterranean Sea, the North Adriatic and Mediterranean Sea case studies). Although not directly connected to the MSFD obligations, the management of the tuna at the Mediterranean scale is considered a success and an interesting source of inspiration in sustainable fisheries. However, there needs to be more focus on surveillance and the enforcement of biodiversity policies in the Mediterranean Sea to strengthen the coherence efforts made at the international and national levels.

Concerning the **offshore wind energy sector**, data from the case studies show different pictures. Looking through the very specific lens of SEAs in Germany, it has been found that the policy instruments set for the implementation of OWE policies were rather effective in internalizing the requirements of EU policies such as the MSFD, the WFD, and the MSPD. The same assessment was done for the Dutch SEAs, which are part of a broader national legal framework that results in embedding environmental conditions directly into offshore wind permits. However, despite the coherence between German and Dutch SEAs and EU directives, the former still present room for improvements in certain areas (especially transparency and addressing the cumulative and transboundary impacts of offshore wind farms on the marine environment). Looking at the bigger scale of the whole French Mediterranean region, the picture is quite different, as data from the case study shows that the OWE must comply with the objectives of the MSFD/MSPD and has implemented tools for marine environment compliance (SEA and EIA). However, in practice there is few explicit cross-referencing of the said objectives into the French energy strategy. The quick development in France of offshore wind energy tends to be prioritized by the authorities over on research and knowledge necessary for environmental protection: there is room for improvement to internalize ecosystem protection in authorizations. Similarly, the policy instruments set for the implementation of MSFD/MSPD/WFD in OWE planning in the Baltic Sea region can be considered only to partially internalise their key requirements of EU policies regarding the delivery of healthy marine ecosystems. In particular, the existing policy framework and institutions do not adapt

as fast as the rapid expansion of OWE in the Baltic Sea would require. In particular, mechanisms to guide strategic and cumulative environmental impact assessments are underdeveloped.

5.2 Q2: Do policy instruments set for the implementation of sectoral policies adequately internalize the EGD objectives?

Concerning the **agricultural sector**, data available from the Finnish case study shows that the CAP 2023-27 is a key instrument for achieving objectives related to the protection of marine biodiversity. However, a challenge remains in financing agri-environmental measures in the most problematic areas[68].

For **aquaculture and fisheries**, the answer varies depending on the EGD objective considered. While pollution reduction and biodiversity protection are progressively given due consideration aquaculture and fisheries policies and strategies at different scales (see for instance the Finnish Archipelago Sea, the Northern Adriatic Sea and the French Mediterranean case studies), limited attention is given to zero pollution and to climate change (see Mediterranean case studie), despite the significant public and political attention given to the latter. Overall, this can illustrate the slow development and adaptation process of these policies and of the institutions that are managing and implementing them, as well as the socio-economic and political pressures and interests that limit the capacity of these institutions to evolve rapidly. In general, however, the EGD is yet to become an explicit reference guiding the implementation of these policies, providing a very strategic ambition and direction that is not yet translated to planning and implementation (in particular at lower governance scales).

Concerning the **offshore wind energy sector**, data from the 5 case studies show that policy instruments can have contradictory effects. For instance, building offshore wind energy farms can have long-term positive impacts for climate change mitigation, but they can be harmful to biodiversity protection and zero pollution objectives without a strict framing of their activities, for instance through SEAs. While in Norway and the Netherlands, SEAs are identified as strong instruments to balance OWE developments with environmental and biodiversity objectives, in Germany SEAs reference relevant EU environmental directives and incorporate environmental considerations into planning, but they do not fully internalise the broader EGD objectives such as climate resilience, marine biodiversity protection, and the sustainable blue economy. SEAs still need to be improved especially regarding the assessment of cumulative and transboundary impacts, in order to achieve policy coherence and the achievement of the EGD goals by 2030 and 2050 and ensure economic development in the field of offshore wind energy does not compromise marine ecosystems. In France, as most of the objectives and actions in offshore wind farm policies are dedicated to developing this emerging sector, the EGD (climate resilience, marine biodiversity conservation) are not directly mentioned or mainstreamed. Authorities have prioritized so far to fund scientific research on the marine environment and have favoured sectoral objectives in the authorization processes, minimizing environmental conditionalities.

[68] No detailed information was provided on the coherence between the Finnish CAP and the "Zero pollution" action plan.

5.3 Q3: Which solutions can facilitate the internalization of the key EGD objectives into sectoral policies?

A common observation between case studies is **the tension, within all sectors studied, between economic growth and environmental preservation.** Policy coherence exists and is slowly being strengthened (e.g. in the agricultural and fisheries and aquaculture sectors), but can also remain subservient to economic opportunities that governments may wish to seize (e.g. in the offshore wind energy sector). Many best practices and elements to improve were identified within the eight case studies presented here, several of them were shared across case studies (e.g. favouring transversal governance mechanisms as opposed to ecosystem management "in silos", or pushing for stronger legal requirements to integrate biodiversity conservation into sectoral policies, as opposed to voluntary measures based on the good will of the private sectors or authorities).

Data from the Archipelago Sea case study shows that one of the main impediments in internalizing the EGD into the agricultural sector is the targeting of environmental measures to reduce nutrient loads and thus eutrophication. Agriculture is included in environmental licensing in a very limited way through animal shelters above a certain size, and legal requirements for manure spreading and fertilisation are vague. The national CAP programme does not provide many context-specific tools for targeting subsidies and other measures to the most problematic areas, such as the Archipelago Sea catchment. There are promising examples in the agricultural policy of using soil improvement measures such as gypsum and lime spreading in the area, but these measures are voluntary in their nature. However, **these measures should be linked to environmental subsidies or to the regulation of manure spreading. The internalisation of GD objectives in sectoral policies cannot be based only on voluntary measures**. **Prior authorisation is an effective tool for the internalising the objective of zero pollution**. In addition, the Finnish Ministry of the Environment has reached an agreement with the urban wastewater treatment sector to reduce its nutrient load more than required by the environmental permits. **The lesson to be learnt from the Archipelago Sea is therefore that voluntary measures and subsidies are not enough to internalise the GD objectives in different sectors. Minimum legal requirements are needed.**

In relation to **fisheries and aquaculture**, the exploitation of resources has traditionally been economical in Europe, with a shift towards the sustainable use of resources. Maximum sustainable yield is one of the objectives of the CFP. States have two sets of tools available to achieve sustainable fisheries and integrate the EGD objectives to the sector: regulatory mechanisms (respecting the frame of the CFP that is an exclusive competence of the EU) and financial mechanisms (mostly through EMFAF).

In the Northern Adriatic Sea and in the French Mediterranean Sea, sectoral policies indirectly contribute to biodiversity conservation through measures such as regulating fishing gear, establishing no-take zones, implementing temporal and spatial fishing restrictions, and contrasting illegal, unreported and unregulated fishing. Although the package of measures is rich, there is room to strengthen it with other science-based measures targeting biodiversity conservation.

Often, there is not a clear link between the sectoral policies and the directives and the EGD biodiversity goals. For example, in the Northern Adriatic, sectoral policies could: (i) provide support for studies and pilot actions to extend the ban on trawling from 3 to 4 or 6 nautical miles (also on a seasonal basis), (ii) foster the support for small-scale fishing operating with sustainable methods, (iii) enhance the definition of co-management schemes for protected areas involving fishery operators (e.g. development of management measures and support to their implementation in the Sites of Community Importance - SCIs IT3270025 and IT4060018 extending across the Veneto and Emilia Romagna Regions), (iv) support co-participation in environmental restoration projects of coralligenous habitats ("tegnue") and marine seagrasses, etc. In France, the fisheries sector could support the research on biodiversity protection. It is regrettable that fishermen do not participate proactively in species monitoring, when they could share their GPS data and carry out monitoring for French research institutes.

In the Northern Adriatic, the link between sectoral policies and the Directives (and EGD indirectly) would benefit by an enhanced and improved **participation process for sectoral stakeholders to the Directives'** (WFD, MSFD, MSPD) **policy processes**. In particular, engagement processes should be designed in a way to ensure the involvement of **small-scale** fishery and aquaculture operators, that are less represented in organisations such as Consortia and FLAGs. In the French Mediterranean Sea, such connection between the fisheries sector and the MSFD/WFD is carried through (i) public meetings to collect local fisherman feedbacks (ii) involving professional fishermen's organisations in the French Mediterranean program of measure design (iii) involving professional fishermen's organisations in the French Mediterranean strategic annual meetings involving more than 50 actors from public, private and research sectors (implementing MSFD, MSPD and WFD and sectoral policies). **AZA plans should be completed within the wider framework provided by MSP** (and in coherence with WFD and MSFD). This implies the allocation of areas for aquaculture while **minimising conflicts with other uses** and impacts on the environment, as well as **maximising synergies with biodiversity conservation.** For instance, the potentialities of restorative aquaculture should be further investigated and applied (as it has been done within the EU-funded project MAREA, focused on reintroducing native flat oyster reefs under mussels' culture sites, investigating the best practices for integration at a pilot site in the Northern Adriatic Sea). It is relevant to consider that mussel farming (low trophic aquaculture) is basically the only form of aquaculture at sea in the area.

Improving the discussion on biodiversity-related topics in **already-existing coordination fora and mechanisms** could positively impact a better integration of biodiversity protection into sectoral policies. Firstly, the **Northern Adriatic Fishing District**, due to its cross-border scope and serving as a model for regional cooperation, can promote innovative measures and actions for a better integration of biodiversity. Secondly, **FLAGs** of the Northern Adriatic can act as promoters of innovative actions fostering the contribution of fishing and aquaculture to biodiversity conservation and restoration. Similarly, in France, as mentioned above, fishermen's professional organisation are highly mobilised to ensure MSPD and MSFD implementation as well as supporting the distribution of funds to the most relevant and innovative FLAG's. FLAG's and local fishermen's organisation are also involved in the discussions around MPA management, to ensure biodiversity protection and sectoral development are not conflicting.

Nevertheless, economic interests and sectors still seem to take precedence in the current discussions on the 30*30 target. This target aiming at covering 30% of the European territory with MPAs should enable the SDG targets to be met, yet bottom trawling is still permitted in most of these MPAs. In the French Mediterranean Sea for example, while 59.1% of waters under French jurisdiction in the Mediterranean have 'Marine Protected Area' status, only 0.1% are subject to regulations governing human activities that provide 'protection' against their impacts (Claudet et al., 2021).

The persistent sectoral silos seem to be one of the main impediments towards more considerable progress to objectives, similar to the GD ones, in the Mediterranean. National fishery authorities are still mainly attending GFCM meetings, while the environmental ones tend to attend the Barcelona Convention meetings and there is limited communication between the two, resulting in divergent policy instruments, despite exemplary high level policy coherence (interviews). It has to be noted that GFCM is trying to engage with both sectors, but is more successful when it comes to fishery one (FishForum). This issue persists throughout governance levels, as even at the international level, the cooperation among the relevant sectoral institutions is not yet the smoothest. DG ENV and DG MARE used to collaborate under the same EU Commissioner, but operationally when it comes to fisheries they still often remained on different positions when it comes to the best ways of engaging with RFMOs (interviews). ***Some interviewees do not see the separation of Commissioners for MARE and ENV, as an issue, as both will want to profile themselves and be seen as doing something, but others have pointed out risks of fragmentation.*** Similarly, while Barcelona Convention works closely with GFCM, they do note that there is a power imbalance, which results in Barcelona Convention needing GFCM more than the other way around. At the same time, there are no interactions between the Barcelona Convention and ICCAT (interviews). The lesson to be learnt is therefore that there should be a more concerted effort to bring all relevant sectors around the table and discuss possible solutions to maintain fishing livelihoods, while also protecting the Mediterranean biodiversity. The currently existing for a, such as MEDAC, FishForum, meeting of the Barcelona Convention, seem to be still very much skewed into one or the other direction (interviews). ***The new working group established under the EU Marine Action Plan, bringing together both fisheries and environmental competent authorities is a new and promising development to bridge the sectoral silos, at least in the EU (interviews).***

Another key issue that is frequently brought up is that there is generally comparatively little data available in the Mediterranean and the quality of that data is often not the highest (interviews). This has been brought up in a variety of official assessments, as well as by interviewees and presenters at the FishForum, so often that it practically a Mediterranean stereotype. This is a consequence of lack of funds. Particularly, in the developing part of the Mediterranean, where funds are scarcer, the environmental monitoring is not high on the list of priorities, but even the EU part of the Mediterranean generally has poorer data available compared to Atlantic and Baltic seas (interviews). The lack of knowledge is often used as an excuse for inaction, particularly when that action could be politically costly (interviews). It is telling that when publicly talking about the climate change RAC, the coordinator of the Barcelona Convention is clear that its role will not be to collect data on climate change effects, the knowledge on that should already be sufficient, but rather to mobilise action to mitigate and adapt to the impacts. Similar outlook is arguably also needed when it comes dealing with biodiversity crisis (interviews, FishForum).

Some interviewers also singled out the lack of political will as the root cause for the issues in policy integration and non-achievement of environmental objectives. They would claim that there are enough funds, but their allocation is dependent on political will, the same as any harder decisions related to restrictions of activities or designations of MPAs. The fact that the more conservation or environmentally geared GFCM Decisions are ultimately not adopted could be attributed to this issue as well. However, on this same topic, securing sufficient political will to protect the Atlantic bluefin tuna was a crucial part of the success of that intervention (Heffernan, 2014, interviews). The Convention that was agreed then, with its effective, well-enforced, and funded governance framework is credit as why the bluefin tuna was brought back from the edge of extinction and is now doing well population wise, while also being a highly profitable fishery (interviews, Heffernan, 2014). While it is hard to imagine the same level of political capital, funding, access to key markets, and enforcement being mobilised when discussing other fish stocks and on a level of Mediterranean, there are nonetheless lessons to be drawn from the way ICCAT is managing their fishery and see which elements can still be applied in the Mediterranean context.

In relation to the integration of the EGD in the **offshore wind energy sector**, different takes away emerge from the research carried out.

Stakeholder engagement

A key lesson emerging from the Baltic OWE context is that cross-sectoral stakeholder engagement remains relatively weak, fragmented, and largely *ad hoc*. Major sectors such as shipping, nature conservation, and cultural heritage are often absent from early planning discussions. In particular, representatives from politically and economically influential sectors (e.g. major shipping companies operating in the Baltic) are frequently reluctant to engage in discussions that could constrain their operational flexibility. This creates a significant barrier to internalising the EU GD's emphasis on integrated, cross-sectoral planning and socially inclusive transition processes. To address this, **early-stage and structured cross-sectoral dialogue is essential.** Engagement should not be limited to economic actors, but must also include stakeholders from fields such as biodiversity, cultural heritage, and local communities, whose interests are often overlooked in high-level spatial decisions.

Data transparency and accessibility remain critical, as discussed with the German North Sea case study. Offshore wind developers collect significant environmental data, yet this information is not always publicly available, limiting the ability to conduct robust environmental assessments. **Strengthening data-sharing mechanisms between government agencies, developers, and researchers would enhance evidence-based decision-making and improve the science-policy interface.** The role of stakeholder engagement is also central. While public consultations exist for MSPs and SEAs, environmental NGOs have reported that their concerns are not adequately reflected in final decisions. Enhancing transparency in decision-making and ensuring meaningful stakeholder participation, particularly for biodiversity advocates, would contribute to a more balanced policy approach.

In France, the integration of offshore wind power is at the forefront of the challenges covered by the French marine environment planning document. In 2024 a public debate took place to renew the French marine strategy (implementing MSFD and MSPD). To raise public awareness

on offshore wind expansion, half of the debate webinars and activities were exclusively covering offshore wind issues. A lexicometric analysis of the contributions during public debate highlighted that the word "wind" was mentioned more often than the word "environment" underlining the prime importance given to offshore wind energy in the sea-related priorities (Guyot- Téphany et al., 2024). If this public debate is a good practice to collect civil society and individuals feedback, no information was given on how the recommendations formulated by NGOs and the public will be taken into account. Power imbalances remain strong: despite efforts made on communication and the organization of public discussions, all the decisions are taken at the Ministry level, together with offshore wind industry representatives.

Finally, other jurisdictions can draw valuable lessons from the Dutch case study: the importance of state-led coordination, integrated permitting, adaptive conditions, and biodiversity-related competition during tender procedures. A forward-looking policy recommendation would be to expand nature-positive obligations, for example, by requiring each new wind farm to contribute to a marine restoration fund or to deliver quantifiable biodiversity gains.

Integrating policy fields and data

Another critical impediment is the lack of comprehensive and coordinated data regarding the long-term ecological impacts of large-scale offshore wind farms. These installations not only generate clean energy but also radically transform marine environments. In the Baltic Sea, there remains limited empirical knowledge about how these changes affect, for example, migratory species, benthic habitats, and ecosystem functioning over time. In France, the government opened a fund of 200 million euros to support scientific research where the offshore wind farms are planned to be installed. However, such scientific assessments require a medium to long period of time in order to understand the complexity of ecosystem interactions. The authorisations granted by the government for the construction of farms in recent years are consequently based so far on limited scientific knowledge. This scientific uncertainty hampers the ability to apply the ecosystem-based approach required by the EGD and the MSFD. Moreover, the environmental implications of OWE must be understood not just during construction, but across the entire project lifecycle (including operation, maintenance, and eventual decommissioning). **Current OWE planning instruments do not yet reflect this lifecycle perspective in a meaningful way, hence a better integration is required between these various policy fields.** Similarly, in Norway there is potential for strengthening the alignment between offshore wind planning and integrated management frameworks, for example by developing clear guidelines on how valuable and vulnerable areas should influence planning decisions, which will be essential for harmonizing environmental and energy objectives.

The Dutch case study on offshore wind development in the North Sea offers valuable insights into how energy and environmental goals under the European Green Deal (EGD) can be aligned through deliberative governance. As the Netherlands scales up its offshore wind ambitions to meet climate and energy targets, it has also positioned itself as a testing ground for policy integration with marine biodiversity objectives. While the country has pioneered

several innovations, it also faces persistent challenges, particularly around strategic environmental planning, institutional coordination, and managing cumulative ecological impacts. These tensions are not unique to the Netherlands; they reflect a broader EU-wide struggle to harmonize rapid climate action with lagging biodiversity protection. **One of the central insights is the importance of early-stage integration of environmental and energy objectives.** By embedding environmental criteria into spatial planning and stakeholder consultations from the outset, the Netherlands has reduced the likelihood of conflicts and project-level delays. However, the influence of Strategic Environmental Assessment (SEA) in Dutch planning remains limited. In practice, SEAs have served more to validate decisions than to shape alternatives, constraining their effectiveness in avoiding high-impact zones. Strengthening SEA at the pre-planning stage, such as through scenario-based assessments, could enhance the ability to steer wind development toward ecologically viable areas. Countries like Germany provide useful comparisons in how the SEA is used to inform offshore area plans, a model the Netherlands could deepen in its upcoming North Sea Programme for 2027-2032.

Strengthening regional and institutional cooperation and coherence

It is also important to highlight the role of regional coherence. In a semi-enclosed sea like the Baltic, protecting one marine habitat in one country alone is not sufficient. **Strengthening regional governance structures and ensuring that national planning aligns with transboundary ecological realities of the Baltic Sea is, therefore, essential to making the EGD actionable** within the marine and energy policy domains.

Institutional coordination is also critical. The Netherlands has made strides through bodies like the Interdepartmental Directors' Consultation North Sea (IDON) and the North Sea Consultation, which bring together ministries and stakeholders across sectors. However, overlapping mandates and diverging priorities between climate urgency and biodiversity obligations can still create bureaucratic friction. Maintaining balanced representation of environmental authorities and civil society in these forums is essential to avoid an overemphasis on speed at the expense of ecological integrity.

In Germany, strengthening cross-ministerial collaboration in particular was highlighted as a solution for better policy coherence. Institutional mechanisms that facilitate joint decision-making and align renewable energy and biodiversity policies are crucial for balancing these objectives.

Assessing the cumulative ecological impacts of offshore wind farms

Cumulative ecological impacts remain insufficiently understood or addressed across projects and over time. While Dutch authorities have initiated a Framework for Assessing Ecological and Cumulative Effects (KEC), broader, predictive tools are still needed to simulate the aggregate consequences of wind farm build-out on migratory species, food webs, and benthic ecosystems. These assessments require not only national but regional collaboration. A basin-wide ecological model, shared across North Sea states, would provide a stronger basis for adaptive management. Such an initiative could be supported through EU coordination (e.g. with the "European Ocean Pact", which focuses, among others, on advancing research,

knowledge and innovation[69]) to ensure consistent assessment methodologies and data sharing across jurisdictions. The German case study highlights the needs for systematic sensitivity mapping and cumulative impact assessments in SEAs and MSP processes. By ensuring that biodiversity considerations are fully integrated from the early planning stages, potential conflicts can be mitigated rather than addressed retrospectively.

In France, a working group on the cumulative effects of marine renewable energy projects has been set up in 2018. This working group designed a method for (i) assessing the cumulative environmental impact of offshore renewable energy projects on biodiversity and marine ecosystems, and (ii) for framing a cumulative impact assessment, which consists in determining the activities, pressures and receptors to be studied in priority. However, these assessments are performed at the wind farm scale and have no transboundary consideration.

Promoting multi-use practices

Another notable dimension of the Dutch approach is its promotion of multi-use and nature-enhancement practices. Wind farms are increasingly seen not merely as energy infrastructure but as platforms for ecosystem restoration and other marine uses, such as aquaculture. The Netherlands has led in requiring "nature-inclusive design" features, such as reef-building scour protection, and incentivizing biodiversity measures in wind farm tenders. This "wind farms and…" framing offers a compelling alternative to the "either/or" trade-off mindset, enabling win-win scenarios for conservation and development. Encouragingly, this practice could be standardized across the EU, potentially supported by new certification schemes or funding criteria favoring projects with ecological co-benefits.

A recurring theme throughout Dutch offshore governance is the emphasis on precaution, adaptation, and compensation. The concept of ecological carrying capacity has become a guiding principle: wind development is staged to align with what marine ecosystems can tolerate, based on ongoing scientific monitoring. Adaptive mechanisms, such as flexible permit conditions or real-time turbine curtailments, ensure responsiveness to new data. At the same time, the Netherlands has committed to compensatory nature restoration when impacts are unavoidable, aligning with the intent (if not always the legal strength) of instruments like the EU Nature Restoration Regulation.

The Netherlands explicitly connects its offshore wind strategy to its marine conservation commitments through the North Sea Programme, creating a unified roadmap under the vision of a "healthy and sustainable North Sea by 2050." This high-level integration ensures that both climate and biodiversity goals are treated as joint, non-negotiable obligations. As offshore wind becomes central to Europe's climate strategy, the EU and Member States must develop similarly holistic approaches that integrate nature and energy planning—structurally, legally, and politically.

However, significant challenges remain. Cumulative ecological effects, particularly impacts on food webs, primary productivity, and stratification patterns, are still not fully accounted for in assessments and planning. Despite progress through programs like Wozep and KEC, knowledge gaps about ecosystem-wide consequences pose risks to long-term marine resilience. This underscores the need for stronger cumulative impact modelling and the integration of

[69] https://oceans-and-fisheries.ec.europa.eu/european-ocean-pact_en

ecosystem indicators, such as the ones under the MSFD, which beyond species-level protections.

Furthermore, while adaptive management is formally embedded in monitoring obligations and permit revision clauses, the scale and complexity of forthcoming offshore wind deployment (toward 50–70 GW by 2050) will test the effectiveness of these adaptive structures. Scientific findings, particularly regarding systemic ecological thresholds, must be rapidly translated into legal obligations to avoid irreversible harm.

Lastly, while the Netherlands is a leader in nature-inclusive innovation, the ecological enhancements often remain project-specific and voluntary beyond minimal requirements. Scaling these innovations to a sector-wide standard, for example, mandatory reef-building features in all turbines, or biodiversity offset obligations, would significantly strengthen coherence with EGD biodiversity ambitions.

SEAs

The main impediments in internalizing the EGD objectives into sectoral policies through SEAs include **limited procedural effectiveness, lack of comprehensive integration of environmental concerns, and insufficient public participation and transparency** (see section 4 for more information). Best practices that could facilitate better integration include **enhancing procedural effectiveness by ensuring early and meaningful public engagement, improving transparency in SEA processes, and strengthening the integration of SEA outcomes** into planning and decision-making processes.

In Norway on the contrary, SEAs are highly comprehensive, involving multiple elements and detailed reports. These assessments cover a wide range of topics, including environmental impacts, social and economic aspects, and technical suitability. The involvement of specialized institutions enhances the quality and credibility of the assessments, ensuring that they are based on the best available scientific knowledge. One of the strengths of the SEA process is its ability to provide detailed information and identify knowledge gaps. The assessments highlight areas where further research is needed, allowing for informed decision-making and adaptive management. One of the main challenges remains to synthesize the vast amount of information generated. The assessments are fragmented, with each topic evaluated through separate studies and reports. **This fragmentation makes it difficult to integrate the findings and understand the cumulative impacts of multiple offshore wind projects.** The lack of standardized methodologies for cumulative impact assessments further complicates this synthesis. Another pitfall is the temporal mismatch between ongoing research programs and the SEA process. Ideally, data from seabed mapping and other environmental monitoring programs should be available before the SEA studies are conducted. However, this is not always the case, leading to gaps in the assessments and uncertainties in the evaluation of impacts

Partly due to the area-based approach to SEAs, the assessment of cumulative and transboundary impacts remains challenging in all case studies. The current SEA process does not fully capture the broader environmental consequences of multiple offshore wind projects, leading to an incomplete picture of overall impacts. **Creating standardized methodologies for cumulative impact assessments can provide a more comprehensive evaluation of**

environmental impacts. These methodologies should consider both temporal and spatial scales to offer a holistic understanding of potential impacts.

Economic incentives

Integrating biodiversity criteria into economic instruments, such as offshore wind auctions, can drive better environmental outcomes. Incentivising nature-positive designs through auction conditions, such as habitat-friendly turbine foundations or biodiversity offset requirements, can help align offshore wind development with EGD objectives.

6. Transversal takeaways from the comparative analysis of case studies

This section reports on Topic Outcomes (Section 1.1.1 CrossGov contribution to the Work Programme" from the DoA) with a Task 3.3 lens on. It is organized based on the main topic identified for the case study analyses in CrossGov DoA (Table 9). As the project and case study work progressed, some topics were prioritized over others. These choices are also a response to the recommendation from the mid-term review of the project to narrow down the scope of the case study work.

Table 9: WP3 analytical topics covered by D3.7.

Topic 1 - Policy (in)coherence, potential weaknesses in cross-compliance, trade-offs and underexploited synergies between marine/maritime policies, legislation and regulation	Covered in D3.7. looking at the tradeoffs and synergies between sector (fisheries, offshore wind) policies and biodiversity legislation and regulation
Topic 2 - Analytical contributions and proposals to improve international, European, national or regional marine/maritime policies, legislation, regulation and their implementation	Covered in D3.7. with proposals on adaptations in the implementation of sector policies as well as SEA/EIA been made. International/regional (sea basin) policy framework investigated in the context of the analysis of fisheries in the Mediterranean sea basin.
Topic 3 - Biodiversity, pollution or climate-related considerations and socio-economic power balances in decision-making.	Considered in D3.7, although "socio-economic power balances" have not been specifically investigated/are considered in a qualitative manner.
Topic 4 - The effects of climate adaptation measures on good ecological, environmental or conservation status and the benefits of nature-based solutions.	Covered in general in WP3, the integration of climate change into sector policies being investigated mainly for (Med) fisheries policies
Topic 5 - Inconsistent regulations of chemicals in emission control regulations, aquatic environmental quality standards, food quality and safety or health standards as well as local level prohibition guidelines.	Following CrossGov midterm review, Topic 5 is not treated in this report.
Topic 6 - Weaknesses in cross-compliance between the CAP, the WFD and the MSFD	Insights on this topic proposed in the Finnish Archipelago Sea, further developed in D3.6 ("Cross-compliance in integrative planning") and D4.1 ("Policy coherence roadmaps").
Topic 7 - The policy making community exploited a better insight in how the Member States' Maritime Spatial Plans (MSPs), River Basin Management Plans and MSFD measures link together concerning climate adaptation and mitigation, biodiversity and ecosystem conservation and restoration, and pollution.	Covered in D3.6 ("Cross-compliance in integrative planning"), referred to for some case studies in D3.7.
International coherence	International coherence has received some attention in this report (North Sea and Mediterranean Sea mainly).

6.1 Policy (in)coherence, cross-compliance, trade-offs, underexploited and/or potential synergies

Case study results illustrate **weaknesses in how sector policies and strategies integrate and consider the ambitions of the WFD & MSFD, as well as of the EGD in relation to zero pollution, biodiversity, and climate resilience.** While **some efforts are made to internalize biodiversity objectives into agriculture and fisheries policies**, as indicated by specific conditions and measures proposed under CAP plans or CFP EMFAF funding, there is still **very limited attention given to climate change in sector policy implementation.**

Regarding aquaculture and fisheries, case study research also shows that in EU Member States, **EMFAF is not yet sufficiently oriented to be used as a concrete incentive for fishing that is closely linked to the sustainable use of resources**. The main mechanisms for enforcing compliance with CFP stock sustainability objectives and MSFD indicators remain so far regulatory and coercive, through temporary bans and landing obligations. A **positive change could come from the European Ocean Pact.** It supports maintaining the focus on the need for sustainable extraction of marine resources to support EU competitiveness and self-sufficiency, with much of the focus on mitigating negative biodiversity effects of fisheries, particularly the bycatch issues (as identified or discussed in new Horizon projects and ByCatch cluster of BioAgora project). The publication of the European Ocean Pact also aims to bring EU's ocean ambitions, including fisheries, biodiversity and climate change in line within one strategic document. It thereby has the potential to bring the different sectors into greater coherence, at least for the EU seas.

Benefiting from a strong political and financial support, it will be a definite challenge in the next decades to **ensure the development of offshore wind energy and the internalization of biodiversity concerns**.

6.2 Improving the implementation of marine-related policies

Task 3.3 illustrates how sector policies are, or can be, implemented accounting for biodiversity, climate resilience, and zero pollution concerns. It illustrates, for example, new mechanisms and developments in agriculture and fisheries policies that account for biodiversity protection and are expected to support the implementation of the MSFD. Work carried out investigate policy implementation at different scales (regional, national to ecosystem/national parts of sea basins). It should be noted that the implementation of each sectoral policy is not systematically carried out at different scales. Addressing how these different scales articulate – or could be better articulated, has not been the focus of all case studies.

Fisheries and aquaculture

At the moment, numerous initiatives to further strengthen the integration of marine-related policies are ongoing on the Mediterranean scale. The Barcelona Convention during their last Conference of Parties (December 2023) adopted an MSP Decision where the intention is that the considerations that the EU MSPD (Marine Spatial Planning Directive) has already introduced be extended to the entirety of the Mediterranean. This was partly the result of the EU pressure, as the European Commission has already been working on MSP with OSPAR (Oslo-Paris Convention) and HELCOM (Helsinki Convention), but there was no appropriate mechanism yet at the Mediterranean level (apart from ICZM-Integrated Coastal Zone

Management Protocol, interviews). Similarly, the concurrent reviews of MSFD and IMAP is also intended to foster tighter integration between the two (interviews). The upcoming establishment of climate change RAC in Türkiye also provides a chance for greater integration of climate change policies and their involvement in other environmental policies at the level of the Mediterranean, although it is at this moment not yet sure if this RAC will function more as a conduit for adaptation to climate change and project support, or as a policy institutions (FishForum, interviews). Similarly, Barcelona Convention (particularly SPA/RAC) and GFCM have also already established fruitful collaboration. The cooperation, integration, and mutual learning are much needed with ICCAT.

The main issue holding back meaningful vertical integration, at this point, seems to be the persistence of sectoral silos. This is evident from the highest levels, since collaborations between European Commission's DG ENV and DG MARE are not fully integrated when it comes to fishery management, with officials in both DGs sometimes arguing for very different approaches still (interviews). This split continues to national administrations with highly segregated biodiversity and fisheries authorities, often in conflict with each other and stuttered communication between the two (interviews).

Offshore wind energy

The Baltic Sea case study identified the limited level of mandatory obligations of as major challenges hindering the implementation of marine-related policies in an OWE development context. The Dutch case study, on the other hand, highlighted interesting institutional set-ups answering parts of the issues met on the Baltic Sea, at the regional or national scale.

Indeed, **the Dutch offshore wind authorization framework represents a rather advanced, integrated system designed to align rapid renewable energy deployment with strong environmental safeguards**. Reformed through the Offshore Wind Energy Act in 2015 (amended in 2021), the regime replaced a developer-led, bureaucratic permitting model with a centrally coordinated, state-led process. This shift, motivated by the urgency of meeting EGD energy targets, embeds environmental protection at the heart of wind farm approval and is now regarded as a best practice by the EU Commission (at least when it comes to the one-stop-shop approach). A cornerstone of the system is **the parcelling decision (*kavelbesluit*), a combined spatial and environmental consent issued by the authorities for each wind farm site within pre-designated zones.** These decisions fix project parameters, including location, size, and key operational conditions, and are based on prior government-led assessments, including EIAs, Natura 2000 appropriate assessments, and technical surveys. By assuming responsibility for these studies and coordinating grid connections via the TenneT operator, the Dutch state reduces the risks for developers and accelerates deployment. This front-loading of environmental assessments **ensures that tendered sites already comply with legal obligations under the MSFD and the Nature Directives**. Furthermore, the adopted "one-stop-shop" model, where environmental, spatial, and infrastructure approvals are integrated, both streamlines the process and ensures early consideration of ecological limitations.

Crucially, **environmental conditions are embedded directly into wind permits, transforming high-level conservation principles into enforceable obligations.** These include site-specific noise limits, seasonal restrictions on pile driving to protect marine fauna, and turbine curtailment protocols during bird migration events. The latter innovation, relying on radar-based forecasts and coordinated through ministerial decisions, illustrates the adaptive

management approach underpinning Dutch permitting. It ensures that energy production can be modulated in real-time to mitigate wildlife impacts, with TenneT, the energy regulator, consulted to safeguard energy security.

Another key feature is the requirement for "nature-inclusive design" (NID), reinforced by the comparative tendering process, in which **bidders are awarded based not only on price but increasingly on ecological and innovative performance criteria** (see tender for Hollandse Kust West VII). Recent tenders have mandated that turbine foundations, scour protections, and seabed interventions incorporate features beneficial to marine biodiversity, transforming industrial infrastructure into artificial reef habitats. These NID measures go beyond mitigation, aiming for ecological enhancement. Furthermore, under the comparative tendering system, developers receive competitive advantage for proposing innovative biodiversity measures. This market-based incentive has stimulated creative solutions, such as combining wind farms with floating solar or seaweed aquaculture, aligning ambitions about biodiversity enhancement with economic competition.

Legal coherence is another strength. Under the Offshore Wind Energy Act, all necessary environmental approvals, including Natura 2000 assessments, are consolidated into the parcelling decision, eliminating redundant permitting tracks. Exemptions for incidental species disturbance are issued within this same process, conditional on robust scientific justification and mitigation. This avoids legal fragmentation and supports the EU Renewable Energy Directive's mandate for permitting simplification. **So far, this integrated model has proven resilient: few legal challenges to offshore wind permits have succeeded, in part due to the comprehensive environmental conditions and limited procedural standing for appeals**.

The Dutch system also places strong emphasis on post-permit monitoring and adaptation. Programs like the Wind op Zee Ecologisch Programma (WoZEP) and MONS collect data on bird strikes, noise effects, and habitat changes, feeding results back into policy. The Offshore Wind Energy Act allows permits and species exemptions to be revised if actual impacts diverge from predictions, ensuring alignment with the precautionary principle. This adaptive capacity is essential in managing cumulative effects on marine ecosystems as wind capacity expands.

In all OWE case studies however, as offshore wind accelerates under the RED III acceleration mechanisms, concerns arise over the potential dilution of environmental scrutiny during the authorization process. Future pressure to meet 2030 targets could test the resilience of the Dutch integrated system and will have to be carefully dealt with by authorities and stakeholders involved in the implementation of marine policies.

6.3 Coherence with the international policy framework

Coherence with the international policy framework was investigated in the three international seas (Baltic Sea, North Sea and the Mediterranean Sea) and for two sectors (OWE and fisheries).

Fisheries in the Mediterranean Sea

Despite the existing policy framework, there is a lack of a formalised process to provide and integrate advice in support of the ecosystem approach into EU fisheries management, with barriers being identified among the lack of capacity to operationalise the concept. Regarding

fisheries and aquaculture, the Adriatic case study makes a single reference to other countries[70]. The Mediterranean case study however has a clear "regional" dimension considering also connections between EU and non-EU countries and how this can affect attention given to the EGD and to coherence between (EU) policies. Results from this case study showed that the integration of climate change policies into either biodiversity or fisheries sectoral policies was very limited, given that there is no Mediterranean-level climate policy yet. Even on the EU level, while there have been successful mainstreaming and significant earmarking of funds for climate actions, these are not being fully used, due to persisting silos and governance issues in coordination of the use of those funds, particularly the EMFAF (interviews). The urgency and political will for climate action at the EU level has not been fully translated yet onto the Mediterranean one (interviews). There is also no reference to international and cross-country coordination in the Finnish Archipelago and German offshore wind energy case studies, although there might be cross-boundary issues in relation on the absence of full evaluation of cumulative impacts (with impacts affecting potentially ecosystems and activities located in other countries).

OWE in the Baltic Sea and the North Sea

The Baltic Sea case study provides severable valuable insights regarding the importance of international policy coherence and cooperation for the sustainable development of OWE. Similar findings have been discussed by the North Sea case studies:

1. On both seas the **need for more robust cumulative impact assessment methodologies** has been pointed at.

Despite the existence of strong regulatory frameworks at the national level, like in the NL, or the work of national programs, in general cumulative ecological pressures from multiple offshore wind farms, combined with existing marine uses (shipping, fisheries, sand extraction), remain insufficiently addressed. While site-specific Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (SEA) are conducted, these tools predominantly focus on isolated impacts rather than capturing large-scale, ecosystem-wide changes. The cumulative impacts on lower trophic levels, such as changes in primary production, food web dynamics, and hydrological stratification, are inadequately incorporated into current legal and planning instruments. Given that Good Environmental Status (GES) under the MSFD requires a holistic view of ecosystem health, the current project-by-project focus risks undermining broader biodiversity goals. Recommendations emerging from the North Sea cases consequently include **institutionalizing a North Sea Cumulative Impact Assessment body under OSPAR or a new EU-driven mechanism** and **developing common ecological indicators for offshore wind effects**. These recommendations cross-check the ones made for the Baltic Sea case study.

2. **Enhanced cross-border coordination** among countries and institutions has also been identified as a major factor to improve policy coherence.

[70] Extracted from above: Lastly, extensive fish and shell farming in coastal lagoons (Grado-Marano, Venice) contributes to ecosystem conservation, being a low-trophic form of aquaculture with low environmental impacts (D'aietti et al., 2007). Additionnaly, the Northern Adriatic Fishing District promotes activities and projects for the sustainable management of fishing and aquaculture activities (e.g. ARGOS, ADRISMARTFISH, DORY, ECOSEA), contributing to fostering a **continuous dialogue with institutions and operators of the North Adriatic area, i.e. Italy, Slovenia and Croatia**

Ecological impacts transcend national boundaries. Species such as harbor porpoises, migratory seabirds, and pelagic fish are transboundary by nature. Thus, national assessments, even if rigorous, are insufficient to protect mobile species and dynamic habitats. In the NL, interviewees stressed the need for North Sea-wide cumulative effect assessments that are **standardized across Member States**, allowing for shared baseline data, joint monitoring programs, and harmonized mitigation strategies. Recent scientific literature, as well as the OSPAR Quality Status Report (2023) for the North Sea, call for the **development of transnational, ecosystem-based management frameworks** for offshore wind and marine biodiversity. As discussed in the Dutch case and the Baltic Sea case, while national innovations (e.g., nature-inclusive design, adaptive tender criteria) are important, they must be complemented by **regional governance mechanisms**. Solutions to advance in this direction include, for example, **promoting joint EIAs or regional SEAs for large-scale offshore energy infrastructure**; or **investing in shared marine biodiversity restoration initiatives**.

7. Conclusions and way forward

The research carried out in the CrossGov WP3 case studies to investigate how the implementation of sector policies internalises biodiversity objectives and the ambitions of the three pillars of the EGD (zero pollution, marine biodiversity preservation and climate resilience) has helped better understanding some of challenges faced at the policy implementation phase for different regional seas and sector policies. Several of these challenges are common to many contexts and sector policies, including the absence of sufficient inter-sector coordination and collaboration, the need to enhance transparency and accessibility to the implications of stakeholder processes or difficulties in capturing (and anticipating) cumulative impacts of economic developments over time.

A wide range of possible solutions has been identified, some very specific to a case while others valid to several cases and policy interfaces. Further work will be required, however, to: (i) better define the conditions required for the effective implementation of these solutions; and (ii) (over-arching) political barriers that might remain making difficult to consider and implement some of the solutions.

Much of the research carried out in the different case studies has focused on (strategic) planning, investigating assessments, processes and regulations influencing the outcome of planning processes. Further work is required also to bring the analysis one step closer to operational implementation of measures, actions and projects and assess the gap that might exist between plans and real operational implementation. Such analysis could further investigate: how financing instruments are effectively used (or not) to support "positive" sectors' practices and projects that (partially or fully) internalize biodiversity protection objectives and the requirements of the MSFD, WFD or H&BD; the challenges faced and solutions proposed by "local operators" for bringing together in their projects and practices some of the existing policy contradictions.

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Annexes

Annex 1: Step 1 report template

Step 1 prepares the case study research design by specifying research objectives, cases, research questions and key actors.

Case Study: _____

1.1 The management and policy context

Basic introduction for someone who does not have much information about the region. It assists in orienting the reader on the "what, where, and why" of the case study. You can include for example key statistics, information on th political regimes in place (EU/non-EU/EEA, ...). A map would be very welcome.

1.2 Research questions

Current situation and main challenges, e.g. statistics on overfishing, climate change statistics and trends, and the biodiversity importance of the region (something that would clarify the reader why the focus on the horizontal and vertical coherence analysis).

***Specific problem/focus** explored within the horizontal analysis; specific EGD explored within the vertical analysis.*

Overarching questions (from D.3.1):

For Task 3.2:

- *Horizontal coherence (e.g., "how do the interlinkages between national and local plans developed under the WFD, MSFD, MSP provide an integrated approach to govern and protect the marine environment?"),*
- *Vertical coherence (e.g., "to what extent does the resulting interplay between these three Directives' national and local plans assists the reaching of the key GD objectives[71]?).*
- *What is the takeaway?, What needs to be done to facilitate the realisation of the key GD objectives? Which lessons can be distilled that can assist the coherence and cross-compliance of marine policies both for their own intended objectives, as well as for the three Key GD ones?*

For Task 3.3

- *Do policy instruments [delivery mechanisms] set for the implementation of sectoral policies adequately internalize key-requirements of EU policies established to deliver healthy marine ecosystems (MSFD/WFD/MSPD)?*
- *Do policy instruments set for the implementation of sectoral policies adequately internalize the GD objectives[72]?.*
- *What can be learnt from impediments and best practices to facilitate the internalization of the key GD objectives into sectoral policies?*

[71] The *three key GD objectives*: zero pollution, climate resilience, and the protection of marine biodiversity
[72] The *three key GD objectives*: zero pollution, climate resilience, and the protection of marine biodiversity

Specific research questions to the case study:

- […]

1.3 Governance and policy focus

Governance system: Describes the multi-actor at a multi-level system; ways of cooperation; includes the table of the stakeholders (EU, RSC, sub-regional, national, local); incudes the policy focus (table, probably as an annex).

1.4 Policies, planning and processes assessed in the case study

Identify existing processes and key documents related to the policy focus. (See M2.1 on Interim mapping of key policies (August 2023), and D2.1 on the EU and international policy landscape (December 2023). Information included in the and the SPS assessment framework (D1.4) can also be of help.

	WFD	MSFD	MSPD	Sector

1.5 Institutions and stakeholders involved in the case study definition and in data collection activities.

Identify key stakeholders associated to the "policy focus" (i.e. who have an influence on the implementation of the targeted policies, instruments, planning and implementation mechanisms and who can be influenced when the implementation of such elements take place) (see D5.2 on the stakeholder database, D5.4 on the stakeholder mobilization charter and its associated Internal operational guidance section, and D3.1 -in particular section 4.3 and Annex 1)

Organization	Relevance (WFD/MSFD/MSPD, sector)

1.6 Data collection activities

Identify the sources of data. Case study methodology relies on multiple sources of evidence, and although not all the approaches (questionnaires, interviews, focus groups, observation processes, document analysis) will be applicable in all the cases, relying on one source of data will not be enough to develop an in-depth understanding of the case (Creswell & Poth, 2018). Please refer to the CrossGov Operational Guidance Illustrated v.2

Bear also in mind that you will need the approval of the Ethics Committee as requested by your institute before initiating the data collection process. Remember also that data collected from these approaches needs to be registered as indicated in D6.1 on a plan for managing primary empirical data). It is also relevant to revise D6.2 on diverse ethical considerations.

1.7 Risks associated to this case study approach.

Identify main areas of risk to complete the case study and solutions for addressing them.

Annex 2: Step 2 report template

Step 2 assesses, within the relevant case study area, the current state of play in coherence and cross-compliance and the implications for policy outcomes. Both frameworks (the D1.3 Policy Coherence framework and D1.4 SPSI framework) have been aligned: in the Policy Coherence framework, the guiding questions for the SPSI explanatory variable are the main questions of each building blocks in the SPSI framework. The current document presents the template that case study leaders will use to document the findings of this assessment.

Case Study: _____

Instructions:

__All information__ answering the frameworks' questions should be made available in this document, which will later be used to write cross-case analyses in WP3, and feed into WP4 (Roadmaps and Methodologies). However, we encourage you to bring out only the __key messages__ in the boxes given below. We therefore would suggest a limit of 2 - 3 pages per variable/attribute. Additional and supporting information, linked to the information provided in the boxes, can be included in the form of annexes. The number of Annexes and the number of pages for these is not limited.

All analyses must be scientifically argued with information gathered from different sources (e.g. literature review, interviews,…).

The documents to use in order to fill in this section are found on NIVA Teams

- *Clean and Updated D1.3 Coherence & cross-compliance methodology Feb 2024*
- *Policy coherence attributes - update and clean*

Based on your case study specificities, __only relevant attributes/variables/blocks__ must be selected and answered. In the boxes below you can document the answers for the questions you addressed. Please bear in mind that we are exploring the relationship (coherence) between policies/plans. We understand that not all the specific case study research questions are answered by means of the coherence framework; for those that do we would be expecting to see a set of completed tables. Please __indicate which cluster of policies/plans/strategies the coherence assessment is being applied to.__

Please also note that the __SPSI framework__ is seen as the further elaboration of one of the explanatory variables of the __Coherence Framework__; something that can help explain the lack of coherence. __Both frameworks (the SPSI and the Coherence framework) have been aligned__: in the Coherence framework, the guiding questions for the SPSI explanatory variable are the main questions of each building blocks in the SPSI framework.

The answers included in the table below for the explanatory variable nr 2 (SPSI) should be seen as a __synthesis__ of the work on SPSI. The __extended responses__ on the SPSI analysis, collected

*by means of the Excel template[73], are expected to be included in an annex of this Step 2 report, and as a narrative. This narrative should be structured/outlined in terms of the four SPSI-steps. Each step should describe the **main results** of:*
Step 1 – Inception phase
Step 2 – SPS System diagram and description
Step 3 – Building blocks analysis (on all BBs or selected BBs according to step 1)
*Step 4 – Synthesis (where needed and **not already covered** in explanatory variable n.2 of C&CC methodology)*

The SPSI framework can be found on NIVA Teams SPS Methodology.The material used in the SPSI training (November 2023) can be accessed here.

*Please note that this **extended responses for the SPSI analysis** are expected on 28th June 2024. The rest of the **Step 2 report** is expected on 30th April 2024.*

***When relevant**, the Figures provided in D1.2 Policy brief and Figure 6 of D1.3 on the graphical mapping of coherence for a case study can be used as inspiration for presenting the data from your case study.*

Research question addressed …   Policies being assessed: …

Coherence attribute nr. 1: Policy Objective	
The outcomes, impacts, or the results that the policy sets out to achieve, as specified in the articles of the policy document, as well as broader objectives referred to in the preamble. May be referred to in policy documents as goals, objectives, targets, or commitments.	For policies to be coherent: - The policy objectives should be aligned or complementary and not contradict or impede each other.
1. Is the policy cross-referencing the policy objectives of another policy?	
… Supplementary information can be found in Annex 1	
2. Are the policy objectives aligned between policies? (substance as well as spatial and temporal scales such as deadlines for achievement, and geographical application)	
… Supplementary information can be found in Annex 2	
3. Are the EGD objectives mainstreamed[74] into the policy?	

[73] The Excel file is to be considered a tool to gather and structure information on the analysis of building blocks. There is no need to submit the Excel pages. The important part is that case studies leaders use the information/knowledge gather through the Excel file (or other means) to develop the narrative of the 4 SPSI-steps (and step 3 in particular) to be included in the annex.

[74] Mainstreaming is understood as the integration of key policy and societal goals and considerations across policies from different sectors. In CrossGov, the focus is primarily on mainstreaming of the EGD marine relevant objectives for biodiversity, climate change and pollution

…
Supplementary information can be found in Annex 3

Coherence attribute nr. 2: Policy Instruments	
- All mechanisms that are put in place by the policy to achieve its objectives. - Set of techniques that governments use, aiming at influencing the behavior of organizations or individuals in support of public objectives - Typologies of policy instruments have been created[75]	For policies to be coherent: - Alignment of policy instruments is considered beneficial for policy coherence.
1. Would / has putting the policy instruments into practice lead / led to results that are in accordance with 1) the policy's own objectives, 2) other policies' objectives, 3) the EGD (CrossGov specific) objectives	
… Supplementary information can be found in Annex 4	
2. To what extent are spatial and temporal scales aligned between instrument of the different policies?	
… Supplementary information can be found in Annex 5	
3. Do the instruments support the cross-fertilization of information and knowledge across policies with similar instruments?	
… Supplementary information can be found in Annex 6	
4. Do policies have shared implementation mechanisms (shared licensing, common indicators, shared monitoring frameworks)?	
… Supplementary information can be found in Annex 7	
5. Do the policy instruments provide mechanisms to deal with conflicting objectives, incentives, etc.?	
… Supplementary information can be found in Annex 8	

After evaluating the two Coherence Attributes (policy objectives and instruments), you are now requested to explore the three sets of Explanatory Variables that help explaining why a certain level of policy coherence is observed. If you found explanations that do not fit into any of these three categories, please document the information in the additional box provided at the end.

Explanatory variable nr. 1: Governmental organizational structures	
- Structures (within/across local, regional and national authorities, EU and international organizations) that set the framework within which policies are formulated and implemented. - These structures include the involved and responsible governmental organizations, their roles and responsibilities, their ability to address broader issues than their own "silo" issues, as well as their coordination mechanisms	It plays a role in the level of coherence: - Organizational behaviour and collaboration to overcome working in silos (e.g. coordination and collaboration within and across organizations[76]) - Clear mandates aimed at overcoming barriers - Clear responsibilities to work towards EGD objectives, and clear means to do so

[75] Examples of typologies: Economic (taxes, charges, fees, fines, penalties, liability and compensation schemes, subsidies and incentives, deposit-refund systems, and tradable permit schemes); Information (state-of-the-environment reporting, impact assessments, labelling schemes, technical standards, education campaigns); Legal (licenses, permits, prescriptions, prohibitions, bans); Compliance procedures (including monitoring and reporting schemes); Enforcement procedures (litigation and access to justice).

[76] Formalized processes such as the creation of supra- or lead institutions, inter-ministerial committees, joint task forces and decision-making bodies; or ad-hoc and informal coordination mechanisms.

1. Are the mandates and roles of governmental organizations governing a policy issue clearly defined (overlaps or redundancies)? How does this affect their involvement in policy formulation and implementation, and their collaboration with other organizations?
… Supplementary information can be found in Annex 9
2. Which intra- and inter-organizational (formal and informal) coordination mechanisms are in place and how do they support coordination across policies?
… Supplementary information can be found in Annex 10
3. Are spatial and temporal scales of governmental organizations well aligned and also fit-for-purpose for the relevant policy issues areas?
… Supplementary information can be found in Annex 11
4. How does resource allocation within governmental organizations affect their ability to formulate and implement policies, and to collaborate with other organizations
… Supplementary information can be found in Annex 12
5. How do political processes and power dynamics within and between governmental organizations affect their influence on policy formulation and implementation?
… Supplementary information can be found in Annex 13

Explanatory variable nr. 2: Science-policy-society interface[77]	
- Social processes that describe the role of knowledge production, transfer, and use in decision-making processes. - It also refers to the actors involved as well as their roles within the different phases of the policy cycle.	It plays a role in the level of coherence: - the use of best available science and knowledge, from across different policy areas and actors, as a base for informed and coherent decisions
1. Are data and knowledge integrated or fragmented and how does this affect policy coherence? Example: Is data available and accessible to all actors of the SPS system? Are data gaps and uncertainty accounted for? Are interlinkages across sectors or governance levels well understood? Is data integrated across disciplines and policies? Is data covering relevant spatial and temporal scales to understand a policy problem.	
… Supplementary information can be found in Annex 14	
2. How do assessments affect policy coherence? Example: Are the assessments transparent? Which actors were involved in developing the assessments, and are some key providers of data and knowledge missing? Were cross-sectoral effects considered, also reflecting on other policy areas or environmental problems?	
… Supplementary information can be found in Annex 15	
3. How do models of knowledge transfer affect policy coherence? Example: Is knowledge production separated from policy-making (=linear) or is it based on a collaborative process? How well is society integrated in the co-production of knowledge? What are the transfer mechanisms in place?	
… Supplementary information can be found in Annex 16	
4. What is the role of Permanent SPSI platforms on policy coherence? Example: Have formal or informal platforms been established? Are the relevant actors engaged and are the platforms covering cross-sectoral dimensions of policies and facilitating coordination across policy areas and governance arrangements?	

[77] This explanatory variable of SPSI sheds light on how stakeholders influence the production and transfer of knowledge; the explanatory variable of Stakeholder Involvement explicitly focuses on how stakeholders shape policy alternatives both during the formulation and design of policies as well as their implementation.

…
Supplementary information can be found in Annex 17
5. How does competence and understanding of the problem/subject-matter affect policy coherence? Example: Do actors in the SPS system have a shared understanding of the problem? Are training and capacity activities enhancing systemic understanding?
…
Supplementary information can be found in Annex 18
5. How does funding and resources affect policy coherence? Example: Are funding and resources allocated in a way that supports the production and transfer of relevant knowledge across governance arrangements?
…
Supplementary information can be found in Annex 19

Explanatory variable nr. 3: Stakeholder involvement[78]	
- Manner in which stakeholders influence policy framing, design and implementation through participatory processes and other avenues such as information campaigns and lobbying, and how this affects coherence across policies.	It plays a role in the level of coherence: - Inclusive, participatory mechanisms that enable active exchange across a broad set of actors and interests, are more likely to have a stronger contribution to coherence than processes involving few interests that may be typical "clients" for one sector only - Involvement of different stakeholders in policy making and implementation processes enables integration of different information, knowledge, values and ideas and fosters agreement and buy in across different interest groups
1. To what extent does stakeholder involvement affect policy choices during design and implementation, and how does this impact coherence across policies?.	
…	
Supplementary information can be found in Annex 20	
2. In how far are formal and informal stakeholder involvement mechanisms at different stages of the policy cycle aligned across policies?	
…	
Supplementary information can be found in Annex 21	
3. In how far do participatory processes (e.g. stakeholder platforms) in the process support the involvement of stakeholders across different policy areas/sectors?	
…	
Supplementary information can be found in Annex 22	
4. Are the consultation/participatory processes inclusive, fair, and equitable ensuring contributions of all relevant stakeholders or do power imbalances mean that contributions are biased towards certain stakeholders?	
…	
Supplementary information can be found in Annex 23	

Additional explanatory information
1. The additional explanatory information in 2-3 sentences.
…

[78] This explanatory variable of Stakeholder Involvement explicitly focuses on how stakeholders shape policy alternatives both during the formulation and design of policies as well as their implementation. The explanatory variable of SPSI sheds light on how stakeholders ~~affect~~ influence the production and transfer of knowledge.

Supplementary information can be found in Annex 24
2 The additional explanatory information in 2-3 sentences
…
.. The additional explanatory information in 2-3 sentences
… Supplementary information can be found in Annex n.

Annex 3: Step 3 report template

Step 3 answers WP3 and case-study specific research questions; summarises other findings (if any); draws conclusions from the cases including areas for improvement.

Case Study: _____

Instructions:

*The number of pages of the STEP 3 report is limited to **10 to 15 pages**.*

All analyses must be scientifically argued following the coherence evaluation framework; they should build up on the basis of the information gathered in the tables of the Step 2 report.

*The key research questions that WP3 aims to address have been fine-tuned along the development of the project. **Erreur ! Source du renvoi introuvable.** presents the questions for WP3 as presented in the DoA (left column) and how these questions have been operationalized with a Task 3.2 and Task 3.3 lens (middle and right columns). Case studies have at the same time defined more specific questions. They have been documented in the Step 1 reports (link to the folder* here*)*

The current document collects the answers to these case specific questions (section 1). We are also asking case study leaders to answer -from the particular problem/angle explored in each of the case studies, the Task 3.2 / Task 3.3 questions (section 2). Finally, any other finding of interest to CrossGov which has not been covered already in the previous two sections, can be documented in Section 3.

Table: 1 Evolution of the WP3 questions through a Task 3.2 and Task 3.3 lens

Key research questions that WP3 aims to address (as stated in the DoA)	Explanations of the questions with a Task 3.2 lens	Explanations of the questions with a Task 3.3 lens
How do the plans and planning processes that implement marine related legal and policy frameworks support or impede progress towards the GD objectives? What explains the degree of vertical coherence towards the GD objectives?	Addresses both: Horizontal coherence (e.g., "how do the interlinkages between national and local plans developed under the WFD, MSFD, MSP provide an integrated approach to govern and protect the marine environment?"), and Vertical coherence (e.g., "to what extent does the resulting interplay between these three Directives' national and local plans assists the	Addresses both: Do policy instruments [delivery mechanisms] set for the implementation of sectoral policies adequately internalize key-requirements of EU policies established to deliver healthy marine ecosystems (MSFD/WFD/MSPD)? and Do policy instruments set for the implementation of sectoral policies adequately internalize the GD objectives[80]?.

[80] The *three key GD objectives*: zero pollution, climate resilience, and the protection of marine biodiversity

Key research questions that WP3 aims to address (as stated in the DoA)	Explanations of the questions with a Task 3.2 lens	Explanations of the questions with a Task 3.3 lens
	reaching of the key GD objectives[79]?).	
What can be learnt from impediments and best practices, as reported in the first two questions, to facilitate the realisation of the key GD objectives?	Addressed by analysing the findings from the first two questions For example: What is the takeaway?, What needs to be done to facilitate the realisation of the key GD objectives? Which lessons can be distilled that can assist the coherence and cross-compliance of marine policies both for their own intended objectives, as well as for the three Key GD ones?	What can be learnt from impediments and best practices to facilitate the internalization of the key GD objectives into sectoral policies?

1. Answering case study-specific research questions

*We kindly ask you to write **1 page max per research question**; we encourage you to use this space to **bring the key messages**. Additional and supporting information can be included in the form of annexes. We also expect to see cross-references to material already presented in the STEP 2 report.*

Case study-specific research question n°1

Your research question: XXXX

Your answer: [1 page max; bring key messages; supporting information in Annex x; cross-reference to material in the Step 2 report]

Case study-specific research question n°2

Your research question: XXXX

Your answer: [1 page max; bring key messages; supporting information in Annex x; cross-reference to material in the Step 2 report]

…

Case study-specific research question n°n

Your research question: XXXX

Your answer: [1 page max; bring key messages; supporting information in Annex x; cross-reference to material in the Step 2 report]

[79] The *three key GD objectives*: zero pollution, climate resilience, and the protection of marine biodiversity

2. Answering the Task 3.2 research questions

*We kindly ask you to write **1 page max per research question**; we encourage you to use this space to **bring the key messages**.*

Task 3.2 research question n°1

Which synergies and conflicts / challenges appear in the operational implementation of River basin management plans (WFD), Marine Strategies (MSFD), and Marine Spatial plans (MSP) with the goal of xxx?

Your answer: [1 page max; bring key messages]

Task 3.2 research question n°2

Whether and how the operational implementation of River basin management plans (WFD), Marine Strategies (MSFD), and Marine Spatial plans (MSFD) are coherently contributing / considering measures to the delivery of the GD objectives of xxx?

Your answer: [1 page max; bring key messages]

Task 3.2 research question n°3

Whether and how the operational implementation of River basin management plans (WFD), Marine Strategies (MSFD) and Marine Spatial Plans (MSFD) are coherently contributing / considering measures for the management of [sector]?

Your answer: [1 page max; bring key messages]

Task 3.2 research question n°4

What needs to be done to enhance horizontal coherence to xxx

Your answer: [1 page max; bring key messages]

Task 3.2 research question n°5

What needs to be done to enhance vertical coherence that would contribute to the delivery of the GD objectives for xxx.

Your answer: [1 page max; bring key messages]

3. Answering the Task 3.3 research questions

*We kindly ask you to write **1 page max per research question**; we encourage you to use this space to **bring the key messages**.*

Task 3.3 research question n°1

Do policy instruments [delivery mechanisms] set for the implementation of sectoral policies adequately internalize key-requirements of EU policies established to deliver healthy marine ecosystems (MSFD/WFD/MSPD)?

Your answer: [1 page max; bring key messages]

Task 3.3 research question n°2

Do policy instruments set for the implementation of sectoral policies adequately internalize the GD objectives?

Your answer: [1 page max; bring key messages]

Task 3.3 research question n°3

What can be learnt from impediments and best practices to facilitate the internalization of the key GD objectives into sectoral policies?

Your answer: [1 page max; bring key messages]

4. Reporting other findings of interest for CrossGov

We kindly ask you to synthesise this section in max. 1 page per topic. Please indicate 3 key words that quickly explain the content of the topic. Additional and supporting information can be included in the form of annexes.

Title of the topic: xxxx

Three key words: XXXX

Elaboration of the topic: [1 page max; bring key messages]

Annex 4: The guiding questions that support the coherence assessment (D1.3 rev Feb 2024).

The answers to these questions have been documented in the Step 2 reports for each of the case studies. See Annex 2 for the template of the Step 2 report.

Coherence attributes and variables	Guiding questions
Coherence attributes	
Policy objectives	1. Is the policy **cross-referencing** the policy objectives of another policy? 2. Are the **policy objectives aligned** between policies? (**substance** as well as **spatial and temporal scales** such as deadlines for achievement, and geographical application) 3. Are the **EGD objectives** mainstreamed into the policy?
Policy instruments	**Main question:** 1. Would/has putting the policy instruments into practice **lead/led to results that are in accordance with** 1) the policy's own objectives, 2) other policies' objectives, 3) the **EGD (CrossGov specific) objectives***? **Supporting questions when several policies are evaluated in concert:** 2. To what extent are **spatial and temporal scales** aligned between instrument of the different policies? 3. Do the instruments support the **cross-fertilization of information and knowledge** across policies with similar instruments? 4. Do policies have **shared implementation mechanisms** (shared licensing, common indicators, shared monitoring frameworks)? 5. Do the policy instruments provide **mechanisms to deal with conflicting objectives, incentives**, etc.?
Explanatory variables	
Governmental organizational structures	1. Are the **mandates and roles** of governmental organizations governing a policy issue clearly defined (overlaps or redundancies)? How does this affect their involvement in policy formulation and implementation, and their collaboration with other organizations? 2. Which intra- and inter-organizational (formal and informal) **coordination mechanisms** are in place and how do they support coordination across policies? 3. Are **spatial and temporal scales** of governmental organizations well aligned and also fit-for-purpose for the relevant policy issues areas? 4. How does **resource allocation** within governmental organizations affect their ability to formulate and implement policies, and to collaborate with other organizations? 5. How do **political processes and power dynamics** within and between governmental organizations affect their influence on policy formulation and implementation?
Science-policy-society interfaces	1. Are **data and knowledge integrated or fragmented** and how does this affect policy coherence? *Example*: Is data available and accessible to all actors of the SPS system? Are data gaps and uncertainty accounted for? Are interlinkages across sectors or governance levels well understood? Is data integrated across disciplines and policies? Is data covering relevant spatial and temporal scales to understand a policy problem?

	2. How do **assessments** affect policy coherence? *Example*: Are the assessments transparent? Which actors were involved in developing the assessments, and are some key providers of data and knowledge missing? Were cross-sectoral effects considered, also reflecting on other policy areas or environmental problems? 3. How do **models of knowledge transfer** affect policy coherence? *Example:* Is knowledge production separated from policy-making (=linear) or is it based on a collaborative process? How well is society integrated in the co-production of knowledge? What are the transfer mechanisms in place? 4. What is the **role of Permanent SPSI platforms** on policy coherence? *Example*: Have formal or informal platforms been established? Are the relevant actors engaged and are the platforms covering cross-sectoral dimensions of policies and facilitating coordination across policy areas and governance arrangements? 5. How does **competence and understanding of the problem/subject-matter** affect policy coherence? *Example:* Do actors in the SPS system have a shared understanding of the problem? Are training and capacity activities enhancing systemic understanding? 6. How does **funding and resources** affect policy coherence? *Example:* Are funding and resources allocated in a way that supports the production and transfer of relevant knowledge across governance arrangements?
Stakeholder involvement	1. To what extent does s**takeholder involvement affect policy choices** during design and implementation, and how does this impact coherence across policies? 2. In how far are **formal and informal stakeholder involvement mechanisms** at different stages of the policy cycle **aligned** across policies? 3. In how far do participatory processes (e.g. stakeholder platforms) in the process support the **involvement of stakeholders across different policy areas/sectors?** 4. Are the consultation/participatory processes inclusive, fair, and equitable ensuring **contributions of all relevant stakeholders** or do **power imbalances** mean that contributions are biased towards certain stakeholders?