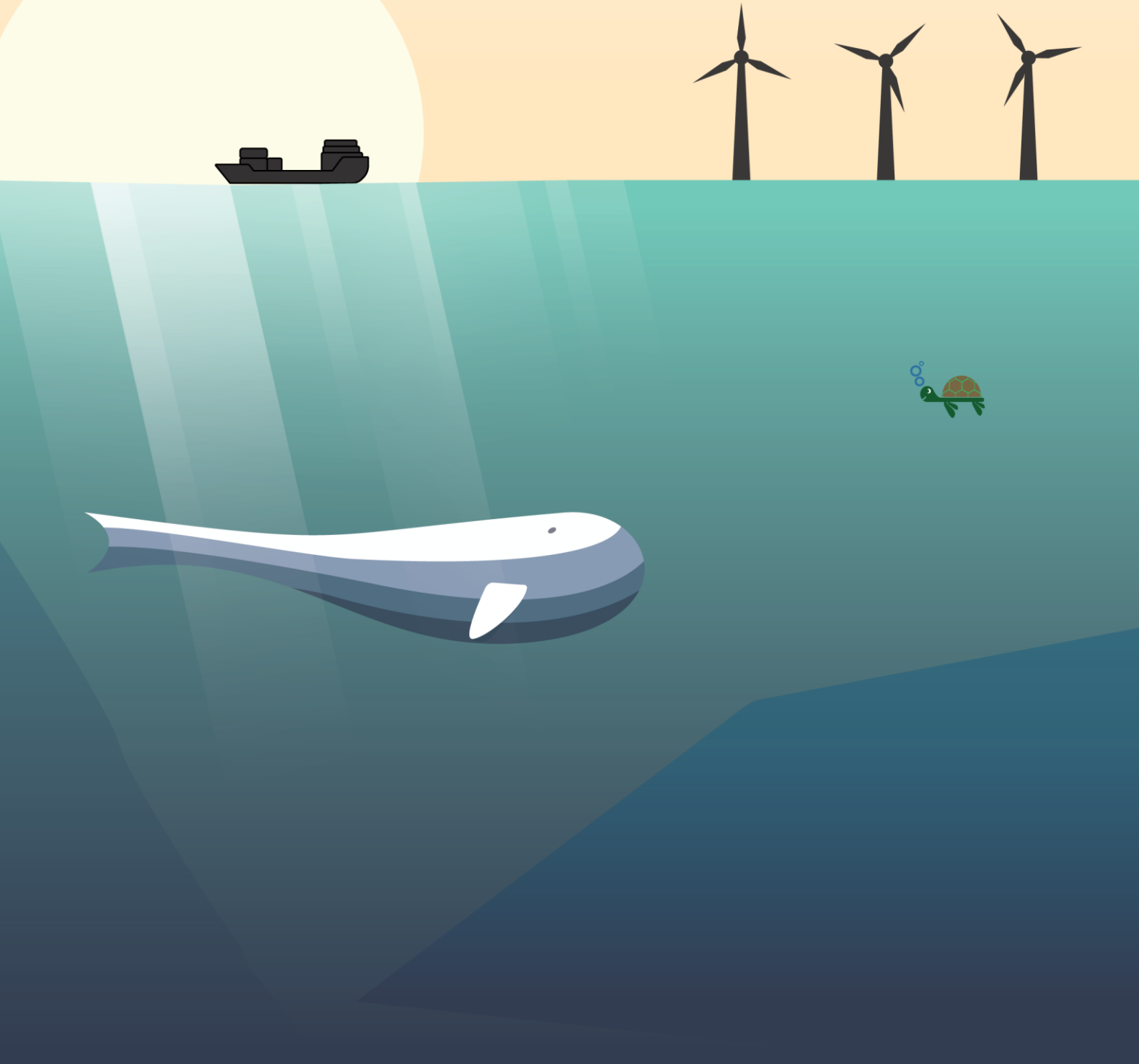
PERMAGOV

D6.2 REPORT OF MARINE GOVERNANCE STRATEGIES FOR THE CASES

Summaries and full reports of nine case studies on the development of governance strategies for the regimes of maritime transport, marine life, marine energy, and marine litter, in support of the European Green Deal goals.



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EXECUTIVE SUMMARY

In collaboration with stakeholders, PERMAGOV has developed governance strategies to improve the implementation of EU- and national policies on marine energy, maritime transport, marine life, and marine litter, thereby supporting the objectives of the EU Green Deal and, subsequently, the EU Ocean Pact. Responding to end-users' and other relevant actors' needs, the strategies strengthen their capacity to address governance challenges and implement policies effectively.

The strategies result from four years' research and development across nine case studies covering different policy fields and geographical contexts. The cases address: integration of shipping into the EU Emissions Trading System (ETS); challenges associated with the green and digital transformation of the European maritime transport sector; protection of seabed integrity in the Baltic Sea; co-management of small-scale fisheries in an Italian MPA; floating offshore wind development in the Celtic Sea; implementation of an energy island in Denmark; offshore wind planning and licensing in Norway; abandoned, lost, or otherwise discarded fishing gear in the Baltic Sea; and, marine litter from agriplastics in the Marina of Cope, Spain.

In each case, existing governance arrangements were mapped and assessed against EGD objectives to identify governance challenges and needs for change. Together with stakeholders, these were formulated into Point of Views (POVs) that provided the basis for strategy development using an innovation methodology combining Design Thinking and backcasting. The PERMAGOV Multi-Layered Collaborative Marine Governance (MLCMG) model guided the analysis of how existing governance arrangements enable or constrain progress towards EGD objectives and where changes and innovations are needed. A strategy typology was used to characterise the formality and functions of the resulting strategies. Risks associated with the strategies and their implementation, and the strategies' potential for upscaling were examined.

The resulting strategies address the identified challenges through a range of governance innovations, for example: 1) more inclusive and transparent implementation of the EU ETS in shipping, including clearer accountability for greenhouse gas emissions; 2) establishing a collaborative European federated maritime data governance ecosystem; 3) integrated and coordinated implementation of the HELCOM Common Approach to seabed integrity; 4) use of the SMART technological data-management platform to support co-management of small-scale fisheries in the MPA; 5) establishment of a dedicated governance body for floating offshore wind in the Celtic Sea; 6) integrated, flexible, and modular decision-making for the implementation of energy islands; 7) a governance approach for offshore wind in Norway based on predictability, knowledge, coexistence, legitimacy, and shared understanding; 8) a collaborative coordination forum to strengthen knowledge exchange, reporting, fishing-gear management, and litter prevention in the Baltic Sea; and, 9) a co-management strategy for the Marina of Cope premised on building reflexivity, dialogue, and trust between sectors.

Across the cases, the strategies highlight collaboration, coordination, and integration as central to addressing complex and interconnected marine governance challenges. Inclusive participation can strengthen accountability, transparency, legitimacy, trust and predictability, while improved knowledge production and e-governance can support more informed and coordinated decision-making. Analysis through the MLCMG model showed that collaborative dynamics were particularly important for overcoming institutional barriers and strengthening the governance capabilities needed to advance EGD objectives. Most strategies primarily support policymaking or offer alternative solutions within existing governance arrangements.

Key risks include insufficient stakeholder participation and support, weak coordination, competing interests, and lack of trust; limitations related to data and e-governance; changes in the wider political and policy environment; and insufficient financial and human resources. At the same time, the cases demonstrate opportunities to scale governance innovations across governance levels, transfer integrated approaches between geographical contexts,

and extend e-governance tools to new areas and challenges. More broadly, successful upscaling depends on inclusive collaboration and social learning; stronger connections across governance levels, national borders and policy domains, including through sea-basin approaches; and systematic consideration of trade-offs and synergies between policy objectives and marine uses.

This Deliverable consists of two parts: Part A synthesises the work undertaken in PERMAGOV Task 6.2 to develop the governance strategies. Part B presents the full reports of the nine case studies, including a summary of the governance strategies and their development processes. All strategies are also available separately on the project website https://www.permagov.eu/results, where they may reflect further developments since the preparation of this deliverable.

PART A: COMPARATIVE SYNTHESIS

1. INTRODUCTION

In collaboration with stakeholders, PERMAGOV has developed innovative governance strategies to improve the implementation of EU and national policies on marine energy, maritime transport, marine life, and marine litter, thereby supporting the objectives of the European Green Deal (EGD), and contributing to the implementation of the EU Ocean Pact. Tailored to end-users' and other relevant actors' needs, these strategies strengthen their capacity to address governance challenges and implement policies effectively.

The governance strategies are based on comprehensive analyses[1] of nine case studies representing the four regime complexes outlined above. These analyses mapped existing governance arrangements and assessed their performance in achieving the objectives of the EGD. To guide this work and identify opportunities for governance change and innovation in response to EGD requirements, the project developed the Multi-Layered Collaborative Marine Governance (MLCMG) model (D4.1; van Noort et al., 2025[2]). The model provides a framework for examining how governance arrangements enable or constrain progress towards EGD objectives and, in particular, helps identify the changes and innovations needed in institutional attributes, collaboration dynamics, governance capabilities, and e-governance to address complex governance challenges. The framework was applied across the nine case studies to assess the need for change and innovation, and to develop strategies towards effective governance and policy implementation.

Building on the analysis of existing governance arrangements and the identified need for change and innovation, the project developed case-specific governance strategies using an innovation methodology combining the principles of Design Thinking and backcasting (D6.1). The methodology offered a structured process to engage stakeholders in identifying governance challenges, envisioning a desirable end-state where the governance challenges are successfully dealt with, and co-creating pathways to achieve that end-state. As a key outcome of D6.1, a Point of View (POV) was selected in each case study to provide a focus for strategy building. This shared POV brought together several actor-specific POVs concerning the identified governance challenges and needs. Suggested criteria for selecting the POV were that it resonated with multiple actors and was prioritised by those willing to engage in the co-creation process. The POVs formed the basis for the ideation and co-creation of governance strategies presented in this deliverable (D6.2). A typology characterizing the formality and primary governance function of a strategy in more or less institutionalized governance arrangements was used to help identify the types of recommendations that the strategies include.

Risks associated with the governance strategies and their implementation were examined, with a focus on political, institutional, and resource-related challenges. Where relevant, sustainability risks and implications were considered. Furthermore, the broader potential for upscaling the strategies and their policy relevance across regime complexes were reflected

[1] These analyses were conducted in PERMAGOV Work Packages 2-6 and they are reported in Deliverables D2.1, D2.2, D2.3, D3.2, D4.2, D5.2, D5.3, and D6.1.

[2] Van Noort, C., van Leeuwen, J., Toonen, H., van Tatenhove, J., Haapasaari, P., Flannery, W., Nielsen, K. N., Boteler, B., Passarello, C., Seeberg Dyremose, S.C., Ratchke, K., and Varjopuro, R. 2025. A multi-layered collaborative marine governance model: evaluating change and innovation of marine governance arrangements. Environmental Policy and Governance 35: 779-793.

upon. These considerations inform D6.4[3] where the results are translated into regime complex level policy briefs for marine energy, maritime transport, marine life, and marine litter.

This Deliverable consists of two main parts. Part A provides a synthesis of the work undertaken in Task 6.2 of PERMAGOV to develop governance strategies in nine case studies, while Part B contains the full reports of the case studies.

Part A is organized as follows. Section 2 briefly introduces Cases 1–9 and their identified POVs, which represent the main governance challenges addressed through strategy development. Section 3 presents the shared methodology, including Design Thinking and backcasting, and provides brief introductions to the MLCMG model and strategy typology, as well as the approaches to assessing risks and the upscaling potential of the proposed solutions. Section 4 summarises the governance strategies developed in the case studies, including their associated risks, alignment with the MLCMG model and strategy types, and potential for upscaling. Section 5 synthesises cross-case findings and lessons learned and reflects on the methodology. Section 6 presents the conclusions.

Part B includes the full reports of Case Studies 1–9, covering the detailed strategy, case-specific methodology, examination of risks, reflection on the strategy in relation to the MLCMG model and strategy typology, and key messages for upscaling. Each case also reflects on the methodology and the strategy-development process.

2. CASE STUDIES

PERMAGOV's empirical work was organized around nine case studies representing four marine regime complexes: maritime transport (Cases 1-2), marine biodiversity (Cases 3-4), marine energy (Cases 5-7), and marine litter (Cases 8-9). Together, these cases provided the basis for analysing governance challenges and developing governance strategies to support the implementation of EU and national marine policies. Brief case descriptions are provided below, while more detailed ones can be found in Part B. Table 1 summarizes the Point of Views (POVs) formulated for each case study during the first phases of the Design Thinking process, as described in D6.1. In some cases, the POV continued to evolve beyond the initial stages of the process, extending into the ideation stage. Articulating the key governance needs and challenges identified by stakeholders, the POVs provided the foundations for the subsequent development of governance strategies.

CASE 1. DECARBONIZATION OF SHIPPING

Case 1 examined the inclusion of shipping in the EU Emissions Trading System (EU ETS) as part of the EU's broader maritime decarbonisation agenda under the EGD and the Fit for 55 package. While the EU ETS is intended to reduce greenhouse gas emissions from shipping through a market-based mechanism supported by the Monitoring, Reporting and Verification (MRV) system, its implementation raises governance challenges related to power imbalance, accountability, transparency, and coordination across jurisdictions. This study focused on three governance challenges: uneven participation in decision-making across the maritime value chain, weak accountability for emissions, and disputes over ETS-related emission surcharges. The selected POV was the need of shippers and cargo owners for greater transparency and assurance that their concerns are fairly considered in EU-level decision-

[3] D6.4 focuses on upscaling, that is, translating case-specific results into recommendations for national, regional sea, and EU policy levels and co-creating governance strategies that support the multi-level implementation of the EGD and the European Ocean Pact.

making, as many perceive shipowners to exercise disproportionate influence over regulatory processes and the allocation of ETS-related costs.

CASE 2. MOTORWAYS OF THE SEAS

Case 2 examined governance challenges associated with the green and digital transformation of the European maritime transport sector. Embedded within the broad policy framework of the EU's Motorways of the Sea initiative, Integrated Maritime Policy (2007), Maritime Spatial Planning Directive (2014), Sustainable and Smart Mobility Strategy (2020), and the EU Ports Strategy (2026), the case study built on the assumption that successful implementation of the EGD in the maritime transport sector depends not only on the ongoing technological and infrastructural change, but even more on new forms of collaboration, interoperability, and data governance among ports, logistics operators, energy providers, and public authorities. The primary governance challenge (POV) addressed by this Case lay in fragmented data exchange across actors combined with a critical deficit in the EU level guidance on cross-sectoral data sharing and the dominance of proprietary software systems, which creates competitive silos and restrict interoperability between Port Community System environments; in addition, innovative digital solutions remain small-scale and fragmented, while needs for coordination increase.

CASE 3. PROTECTING SEABED INTEGRITY IN THE BALTIC SEA

Case 3 addressed governance challenges associated with implementing regional (Baltic Sea Action Plan) and EU (MSFD) policies aimed at preserving seabed integrity in the Baltic Sea. The case study focused on developing a governance strategy for HELCOM's "Common Approach" seeking to minimize seabed loss and disturbance caused by human activities. The overall governance need is to improve coordination and coherent implementation of seabed management activities in the Baltic Sea region to reach good environmental status. Four more detailed requirements for the operationalisation of the CA were defined. It had to 1) be cross-sectoral to enable dealing with cumulative impacts on the seabed and to coordinate between diverse sectoral management approaches, 2) support coordination of HELCOM Contracting Parties' joint activities in seabed protection, 3) enable practical coordination of seabed-related actions within HELCOM, and 4) be compatible with national approaches.

CASE 4. SUSTAINABLE FISHERIES IN THE MEDITERRANEAN MPAS

Case study 4 focused on the marine protected area (MPA) of Torre Guaceto in Southern Italy. The MPA applies a co-management approach involving local communities (e.g. local fishers and voluntary guards) to share responsibilities. Being valuable players in the socio-ecological system, they can combat pressures such as illegal fishing and unauthorized activities inside the protected area. This approach increases adaptive management capacity, but at the same time, it faces challenges regarding enforcement, stakeholder participation and access to information. Thus, the POV of the strategy development related to the need for effective monitoring and surveillance system and better sharing of data between actors involved in the MPA management.

CASE 5. FLOATING WIND IN THE CELTIC SEA

Case 5 focused on the governance challenges associated with offshore wind development in the Celtic Sea. The UK's jurisdiction hosts one of the world's largest floating offshore wind (FLOW) project pipelines. The development of a new FLOW industry in the UK's Celtic Sea presents a complex set of governance challenges related to coordination and collaboration within and across multiple policy domains (energy, climate, fisheries, environment, trade, and defence) and governance scales. These challenges persist because there is no single institution with a mandate to lead coordination on Celtic Sea FLOW development and delivery. Instead, roles and responsibilities are embedded in a multi-scalar governance arrangement that includes UK central government departments, the Welsh devolved government, English and Welsh regulatory bodies, two Corporate Joint Committees in south Wales, a combined mayoral authority in the south-west of England, and multiple local authorities across England and Wales. Furthermore, there are multiple regional stakeholders who are contributing knowledge, expertise, and resources to advance FLOW ambitions, although competitive tensions hinder collaboration and coordination and contribute to resource inefficiencies. The lack of an overall lead for Celtic Sea FLOW leaves the region vulnerable to changing political priorities and undermines efforts to secure regional economic, environmental, and social value from FLOW development. The POV of the strategy development related to the need for a single unified voice for Celtic Sea FLOW and improved collaboration, coordination, and alignment across the region.

CASE 6. ENERGY ISLANDS IN DENMARK

Case 6 focused on understanding the interconnected challenges involved in the development and implementation of the Energy Island (EI) planned for Bornholm in the Baltic Sea, and on developing a modular planning structure to manage them. Given a turbulent development process of the EI, increasing geopolitical tensions, and delays due to economic uncertainty, the focus of the project has turned from the feasibility of the EI towards the implications of its implementation and its role in the path towards decarbonisation within the EU. The combined energy crisis and the EU calls for energy independence put pressure on large-scale offshore projects, which contradicts the drawbacks and prolonged delivery of this EI project. New pathways should support the Baltic Sea EI to ensure its contribution to sustainable energy development in the future, while not overruling the needs of local people in the area in which it is placed. The POV chosen thus related to governance challenges of procedural justice, legitimacy, and place-based engagement in the development of the EI.

CASE 7. DEVELOPMENT OF OFFSHORE WIND ENERGY IN NORWAY

Case 7 focused on opening areas for offshore ocean wind production in Norway and getting licenses for specific ocean wind projects within these areas. Norway has put an increased focus on accelerating renewable energy and it aims to, by 2040, allocate areas that can produce 30 GW wind power. Key policies relevant to ocean wind development in Norway seek to secure long-term value creation of Norwegian energy resources, reduce climate emissions, and meet multiple objectives. The latter involves finding solutions that can secure co-existence between different users of ocean space, including environmental values. The POV chosen was to secure good co-existence with fisheries and marine nature in allocating areas for ocean wind, which was seen as a prerequisite to secure political support for the subsidies the ocean wind industry needs to realize individual projects.

CASE 8. ABANDONED, LOST OR OTHERWISE DISCARDED FISHING GEAR IN THE BALTIC SEA

Case 8 addressed the governance of abandoned, lost, or otherwise discarded fishing gear (ALDFG) in the Baltic Sea. ALDFG harms marine habitats and wildlife and poses risks to human activities such as tourism and fishing. Despite policy and regulatory frameworks in place such as the EU's Zero Pollution Action Plan, the Single-Use Plastics Directive, the Port Reception Facilities Directive, and the HELCOM Regional Action Plan on Marine Litter (RAP ML), ALDFG in the Baltic Sea persists. The core governance challenges hindering the achievement of regional policy objectives include gaps in knowledge and data, weak collaboration among key actors, and limited incentives for participation in collaborative actions. Moreover, a clear and simple approach to tackle ALDFG in the Baltic Sea is missing, leaving policy makers to pursue disconnected and potentially ineffective ALDFG strategies. Successful ALDFG action depends on the interaction between EU rules, HELCOM processes, national implementation, and operational actors, including fishers, ports, waste managers, NGOs, and gear producers. The POV related to establishing coordination across governance levels to connect activities across, e.g., prevention, reporting, retrieval, port reception, waste handling, recycling or disposal, and producer responsibility.

CASE 9. AGRIPLASTICS IN THE REGION OF MURCIA, SPAIN

Case 9 focused on the contestation between agricultural and environmental actors in the management of the Marina of Cope and the need to improve knowledge of each group's management needs. The Marina of Cope, located in the Region of Murcia, Spain, is a Regional Park and biodiversity hotspot for semi-arid and coastal ecologies. It is also an agricultural hub, formerly of traditional dry agriculture and in recent decades of intensive irrigated agriculture. The region lacks formal governance controlling how agricultural activities may be carried out and how to protect biodiversity, which has further exacerbated contested governance dynamics. The reflexivity of the actors to know, perceive, and empathise with each group's needs is significantly constrained. Both groups felt like they were not heard, ignored, not considered, and even vilified, by governing institutions and the other groups. These challenges in reflexivity reduced collaborative dynamics and cross-sectoral solutions to effective governance within the Marina. This issue was the entry point (POV) for developing governance strategies to better support farmers whilst achieving environmental protection for the region's biodiversity.

TABLE 1. NINE CASE STUDIES AND THEIR POINT OF VIEWS (POVS)

Case	Case description	Point of View (POV)
1. Decarbonizing shipping	Challenges related to the integration of shipping in the EU emission trading system to accelerate the decarbonisation of shipping	Shippers need to understand how their concerns are being addressed and weighed in decision making processes at the EU level
2. Motorways of the sea	Governance challenges associated with the green and digital transformation of European maritime	Port authorities need interoperable governance systems, trusted data exchange and clear data

	transport, including the role of ports in enabling interoperable, efficient and sustainable transport systems.	governance rules to overcome fragmented digital ecosystems and support coordinated green and digital transformation.
3. Protecting seabed integrity in the Baltic Sea	Governance practices and challenges to implementing regional sea (Baltic Sea Action Plan) and EU (MSFD) policies to protect seabed integrity in the Baltic Sea, with a special focus on HELCOM BSAP "Common Approach"	Improve coordination and coherent implementation of seabed management activities in the Baltic Sea region
4. Sustainable fisheries in the Mediterranean MPAs	Opportunities and challenges of the effective co-management of small-scale fisheries in the Torre Guaceto MPA in Italy	Need to formalize the MPA co-management, effective data and information sharing about the MPA status, illegal activities, and the level of success of the MPA
5. Floating wind in the Celtic Sea	Barriers and enablers to developing a new offshore wind industry in the Celtic Sea	Need for a coordinated and coherent approach to floating wind development to maximise environmental, social, and economic benefits for the Celtic Sea region.
6. Energy islands in Denmark	To identify governance dynamics occurring in the planning, development and implementation of the Baltic Sea Energy Island, and identify how these contribute to Green Deal decarbonisation goals.	Governance challenges of procedural justice, legitimacy, and place-based engagement in the development of the EI
7. Development of offshore wind energy in Norway	Processes of opening areas for ocean wind production and related licensing	Securing good co-existence with fisheries and nature in allocating areas for ocean wind
8. Abandoned, lost or otherwise discarded fishing gear in the Baltic Sea	A cross-cutting and transboundary governance challenge involving multiple levels of policymaking and a diverse set of stakeholders	Better coordination across national, regional, and EU governance levels
9. Marine litter in the Mediterranean Sea - Agriplastics as a source of pollution in the region of Murcia, Spain	A localised, novel, and emerging object of governance involving a complex array of actors working at multiple levels and within multiple policy domains	Limited reflexivity and mutual understanding reducing collaborative dynamics and cross-sectoral solutions to effective governance

3. METHODOLOGY TO DEVELOP GOVERNANCE STRATEGIES

3.1. DESIGN THINKING AND BACK-CASTING

The POVs described above (Table 1) provided the starting point for the development of governance strategies. A jointly agreed methodology was applied across the cases, with adaptations made in each case to reflect its specific characteristics and needs. The methodologies varied depending on the number and composition of actors involved, the types and number of meetings organized, the methods combined for collecting data and gathering stakeholder views, and other case-specific considerations. The procedures of each case are described in detail in the case reports (Part B of this Deliverable).

The shared methodology for developing governance strategies followed the principles of Design Thinking combined with a back-casting approach for ideation (presented in D6.1). The Design Thinking methodology includes five stages (Table 2), which were applied in line with PERMAGOV's objectives: *1) Empathize,* to identify key actors and understand their needs in relation to the governance challenges of implementing the EGD, and to evaluate the likelihood of the governance arrangements to meet the EGD goals; *2) Define,* to formulate actionable joint problem statements in terms of Point of Views (POVs) to identify the key challenge to be addressed in the ideation phase; *3) Ideate*, to explore, together with end-users, solutions to the key challenges by defining, based on the POV(s), the preferred end-state of governance arrangements, and identifying ways to achieve it; 4) *Prototype*, to produce prototypes of strategies describing possible pathways and/or actions for improving governance, and; 5) *Testing* with actors and experts to get feedback and validate the ideas for the governance pathways.

TABLE 2. DESIGN THINKING TO DEVELOP GOVERNANCE STRATEGIES IN PERMAGOV

Phase	Objective	Deliverable
Empathize	Understand governance actors' needs to overcome challenges to implement EGD	D6.1
Define	Formulate key actors' problem statements in terms of POVs and jointly select/agree a shared POV	D6.1
Ideate	Define preferred end-state Co-develop governance solutions towards the end-state	D6.2
Prototype	Describe the governance solutions and associated strategic aspects in detail	D6.2

Test	Validate the governance strategy Assess risks to implementation and sustainability	D6.2

The strategy development was informed by PERMAGOV work carried out across different work packages from the start of the project. In Task 6.1, stages 1 and 2 of Design Thinking were completed in all nine case studies and reported (D6.1). This included assessing the performance of governance arrangements in relation to EGD and other policy objectives, identifying and presenting the POVs of key actors, and describing the process through which a shared POV was selected to guide the subsequent ideation phase. This deliverable (D6.2), focuses on stages 3-5 of Design Thinking, namely ideating, prototyping, and testing. These stages guided the development of a preferred future state for each case study and the identification of governance pathways and actions to move from the current situation towards that future vision, thereby addressing the key challenges highlighted in the case studies.

The POVs selected in the Define stage formed the basis for Ideation. In the Ideation stage, backcasting was used to connect problem definition with solution development and anchor the process in a shared vision of the desired future (Figure 1). This enabled stakeholders to consider the preferred end-state (Figure 1, Step 2) in connection with the joint problem formulation (Step 1) before identifying actions and action lines (Step 3) to achieve the end-state.

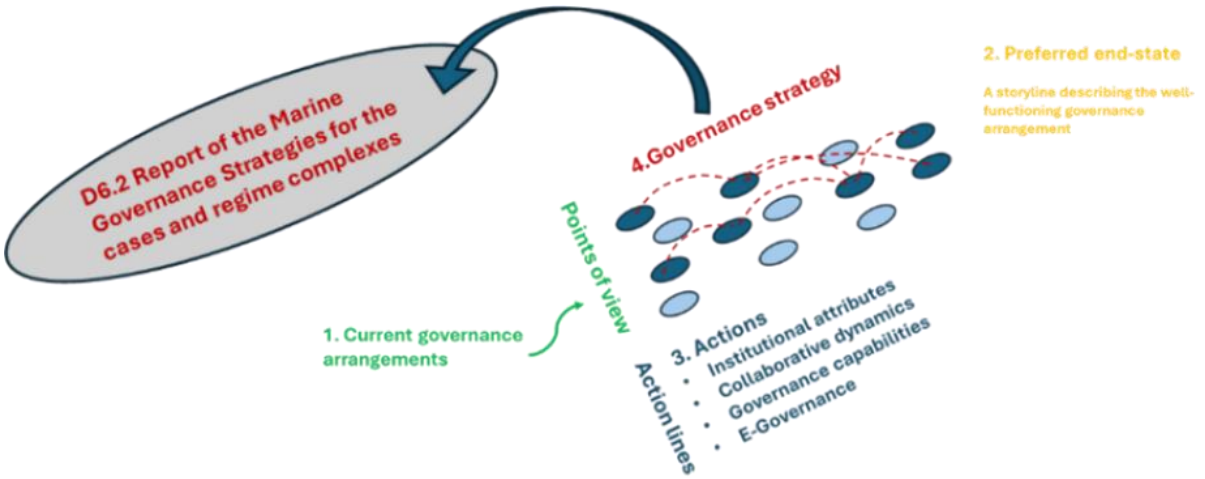


FIGURE 1. FOUR STEPS OF BACKCASTING APPLIED TO DEVELOP GOVERNANCE STRATEGIES

At the beginning of the Ideation stage the cases worked with end-users and other key actors to define the desired end-state outlining how the key elements of the governance arrangement would be organised and operate to successfully reach this state. The starting point for the desired end state was the POV. After formulating the desired end state, pathways towards the end-state were identified. The inputs were analysed and formed the bases of a prototype of the governance strategies.

The prototype included pathways and actions and described a strategy for how actors can address the identified governance challenges. It could also provide a basis for further specifying the actions and their associated aspects. In the testing stage, the prototypes were used to validate the governance strategy with end-users and other stakeholders, and identify

possible risks, including sustainability concerns. This stage provided feedback on whether the strategy was realistic and feasible.

3.2. THE MULTI-LAYERED COLLABORATIVE MARINE GOVERNANCE MODEL

The strategy development process was guided by the MLCMG model (D4.1; van Noort et al. 2025) (Figure 2). The model offers a simplified representation of how marine governance arrangements change and innovate over time. It brings together components to study the enabling and constraining conditions of marine governance arrangements to support progress towards EU visions on ocean sustainability as expressed through the EGD and Ocean Pact as well as national level policy objectives, and to identify how these components can be addressed to generate innovation and change.

The left part of the model[4] depicts the status quo, namely the existing marine governance arrangements (actors/coalitions, rules of the game, resources, and discourses) that may or may not support the achievement of EGD objectives. The middle part depicts the dynamic process of innovation and change to achieve the EGD goals. It consists of institutional attributes that enable or constrain change, collaborative dynamics (comprising principled engagement, shared motivation, and capacity for joint action), governance capabilities (reflexivity, resilience, revitalization, rescaling, responsiveness), and e-governance that can lever the dynamics of the other components (through seeing and knowing; participation and engagement; and/or interventions and actions). Process performance refers to the social and technological capacities that support governance actors in decision-making and social learning. Productivity performance focuses on the cumulative results of change and innovation, namely outputs, outcomes, and impacts. On the right, the new status optimized to achieve the EU vision is depicted.

Using the EGD vision as a normative reference point against which governance performance can be assessed, the model supports studies of governance performance, innovation, and change. Case study reports 1-9 reflect the elements of the MLCMG model that were most prominently incorporated into the governance strategies and considered most relevant for achieving the EGD objectives in each case.

[4] For details of the model components, see van Noort et al. (2025).

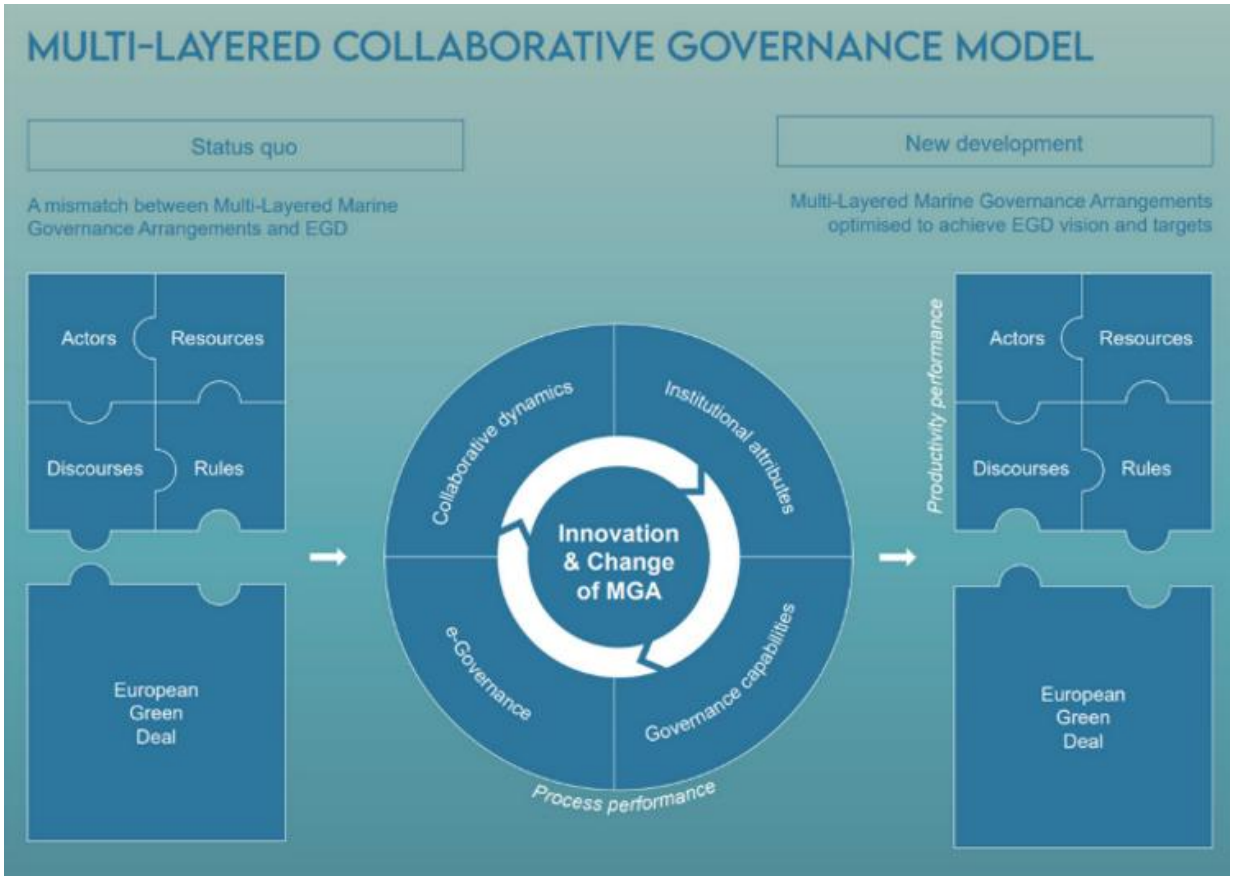


FIGURE 2. THE MLCMG MODEL COMPRISES COMPONENTS THAT INFLUENCE THE PERFORMANCE, INNOVATION, AND CHANGE OF MARINE GOVERNANCE ARRANGEMENTS. THE LEFT SIDE DEPICTS THE EXISTING GOVERNANCE ARRANGEMENTS (STATUS QUO), THE MIDDLE PART REPRESENTS PROCESSES AND ELEMENTS OF

3.3. STRATEGY TYPES

The PERMAGOV case studies targeted different marine regimes and governance problems in different contexts, and thus, the produced strategies vary, also in terms of their function and formality. To support the characterization of the strategies in terms of their functions and formality, a typology was adapted from a conceptual framework used for knowledge co-production in the context of transition arenas[5] (Figure 3). The typology provides a lens for examining the strategies' functions in governance and their formality.

The strategies can seek to improve existing governance arrangements or address contexts where no formal governance arrangements exist or where they are unclear. Similarly, strategies can vary in their function, ranging from fostering a shared problem understanding among relevant actors, to developing concrete governance pathways to address a problem. Rather than representing discrete categories, these dimensions form continuums, and individual strategies may be positioned anywhere between the respective endpoints.

For existing governance arrangements, a strategy can produce recommendations for policy making (comparable to the White Papers of the EU) or outline alternative solutions to solve the problem with the purpose of inspiring discussion (comparable to EU Green Papers). In the context of missing or unclear governance arrangements, a strategy can aim to improve

[5] Lähteenoja, S., Lukkarinen, J., Hyysalo, S. 2025. Vaihtoehtojen avaamista vai politiikan määrittelyä? Murrosareenat kestävyysmurroksen edistämisessä, Alue ja Ympäristö 54(2): 141-159 (Available only in Finnish, with an English abstract).

understanding of the transition potential of governance or enhance experimentation, that is, develop new ways to approach the problem or organize governance arrangements. However, a governance strategy may include elements that would be located into more than one segment of the scheme. The case study reports include a consideration of how the strategies relate to the strategy types.

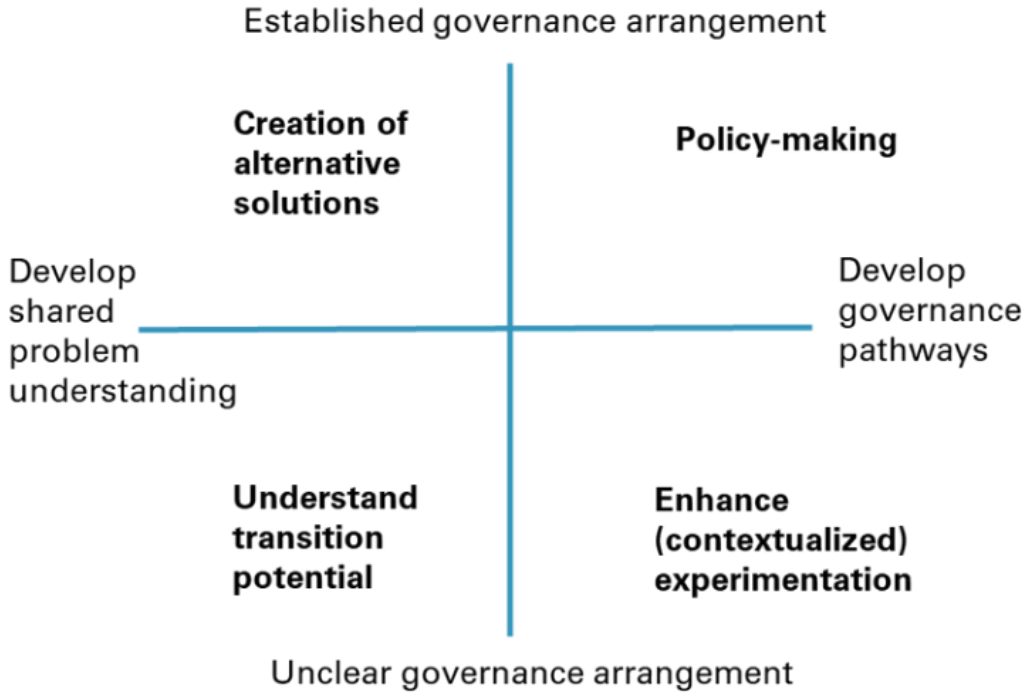


FIGURE 3. FOUR-QUADRANT MATRIX DEPICTING DIFFERENT TYPES OF GOVERNANCE STRATEGIES.

In the figure the x-axis represents the primary aim of a strategy, ranging from enhancing understanding of the problem to developing governance pathways, while the y-axis represents variation in the degree of institutionalisation of governance arrangements. Where governance arrangements are already established, PERMAGOV's governance strategies can contribute to existing policymaking or develop alternative solutions. Where such arrangements are less established, the strategies can help structure understanding of the transition potential of governance or support experimentation to develop new governance arrangements.

3.4. RISKS, CHALLENGES, AND SUSTAINABILITY CONSIDERATIONS

The feasibility and robustness of the governance strategies were examined by considering risks that could affect implementation. Depending on the case study, political, institutional, and resource-related risks as well as sustainability-related risks and impacts arising from the application of the strategies were identified. During the development of the governance strategies, it became evident that policy and even political landscapes are changing rapidly. For example, PERMAGOV started at a time when the EGD provided the guiding policy framework for the EU. With the new Commission, political priorities have partially shifted. As a result, the European Commission launched the EU Ocean Pact, among other policy initiatives, and began drafting new marine policy legislation, the Ocean Act. Some of these changes have been taken into account in the PERMAGOV governance strategies, but many

future changes cannot yet be foreseen. This uncertainty is reflected in the governance strategies by acknowledging foreseeable or possible changes that may affect their implementation.

While comprehensive risk and impact assessment of the strategies were beyond the scope of the project, lighter stakeholder- and expert-based screenings of their likely risks and/or implications were conducted in the case studies, as considered relevant. Screening and assessment of risks and impacts were undertaken using different approaches, depending on the context. Some case studies conducted the assessment as a desk-based exercise together with the end-user partner involved in the project, drawing on relevant literature, policy documents, and existing evidence. In other cases, desk-based assessments were complemented or replaced by consultations with stakeholders and external experts. Some cases examined risks in stakeholder workshops. To accommodate the diversity of governance contexts and case-specific conditions, case study teams were given flexibility to select the assessment approach considered most appropriate and robust for their case.

Risk considerations addressed, e.g., unforeseeable or already ongoing changes in the political landscape of the EU or globally that can change conditions for implementing the governance strategies. Also, risks related to financial or human resources, or other potential case-specific risks were considered. The United Nations Sustainable Development Goals (SDGs) were used in several cases to consider the implications of the strategy to environmental, economic, and social sustainability.

3.5. UPSCALING

To support the development of PERMAGOV Deliverable D6.4 (Policy Briefs on the Upscaling Potential of Governance Strategies), the case studies reflected on the broader policy relevance of their governance strategies and the potential of the findings to be upscaled or replicated. This involved identifying lessons and governance approaches that could be transferred beyond their specific contexts. Particular attention was given to insights from local partnerships and governance initiatives that could strengthen collaborative governance across multiple levels and support the implementation of EU policies and EGD objectives in other settings.

The analysis identified key messages for EU and other high-level decision-makers, as well as recommendations for the policy areas addressed by each case. These reflections provide input to D6.4, which will translate case-level findings into recommendations for national, regional/sea-basin, and EU levels and examine how governance strategies can support the multi-level implementation of the EGD and the European Ocean Pact.

4. SUMMARIES OF GOVERNANCE STRATEGIES DEVELOPED IN CASE STUDIES

The governance strategies summarized here are available separately on the project website https://www.permagov.eu/results, and presented also in the case reports in the part B of this deliverable.

CASE 1. DECARBONIZING SHIPPING

Governance strategy: Case 1 addressed the potential of integrating shipping into the EU Emissions Trading System (ETS) to accelerate the decarbonisation of the sector. The POV

was defined as shippers' and cargo owners' need for greater transparency and assurance that their concerns are fairly considered in EU-level decision-making. A governance strategy, including a timeline, was developed to resolve challenges relating to uneven participation, lack of transparency in ETS surcharges, and unclear accountability for greenhouse gas emissions, all of which hinder fair and transparent shipping decarbonization. The governance strategy consists of three Strategic Pathways including ten action lines (see Part B/Case 1). Pathway 1 aims to involve actors across the value chain in decision making and practices, and its action lines relate to stakeholder participation, knowledge production, and knowledge sharing. Pathway 2 relates to a clear ETS cost sharing process, including actions related to payment rules and roles. Pathway 3 pursues standardized emission estimation and cost calculation, with action lines related to cost calculation, data sharing, audits, addressing stakeholder concerns and grievances, incentives, and technical infrastructure.

Identified risks: Potential risks are that the proposed ETS calculator may not accurately estimate actual emissions**,** as it captures only a portion of environmental costs, and that it may facilitate greenwashing if used primarily as a marketing tool. Shipping companies could use inaccurate data sourced from multiple systems, leading to incorrect surcharge calculations and exposing the ship owner to financial losses. Also, risks of free-riding and dominance by powerful actors were identified. Politically, the EU ETS as a cornerstone of EU climate policy poses the risk of ships calling at non-EU ports to reduce their costs, eroding the competitiveness of the EU ports, compromising the integrity of the ETS and related policies, and creating uncertainties in relation to the future of such policies.

Case Reflection through the MLCMG Lens: The governance strategy primarily addresses the institutional barriers that in maritime transport governance inhibit transparent and fair decarbonisation. These include shipowner-centric nature of EU maritime transport governance, lack of transparency and accountability in emissions and their costs, and conflicts and stakeholder concerns related to ETS surcharges. The strategy also reflects the e-governance component of the MLCMG model by proposing an online emission estimation and cost calculator. The strategy relates to collaboration dynamics by supporting the creation of knowledge sharing and collaborative research and development platforms. In terms of governance capabilities, the strategy supports the creation of innovative knowledge sharing and collaborative platforms such as Green Shipping Corridors and private-led initiatives such as Zero Emission Maritime Buyers Alliance. It also proposes improved information sharing through stakeholder participation in decision-making and establishment of grievance redress mechanisms, to enable actors to reflect and redefine the complex governance challenges.

Strategy types: By addressing challenges related to EU decarbonization policies, the strategy primarily contributes to policymaking within existing maritime transport governance arrangements. The development of ETS emission calculator would enhance contextualized experimentation and the creation of alternative solutions to explore how such a common platform for emission calculations can be implemented, and the associated challenges. It could also create an alternative solution to the already existing carbon emission calculators which often show unclear parameters, data security concerns, and come at a high cost for their use.

Key messages for upscaling: The case study demonstrates that inclusive stakeholder engagement in decisions on shipping emissions, costs, and investments can strengthen knowledge, innovation, and skills while supporting the implementation of EU maritime decarbonization policies, including the EU ETS. The EU's leadership in integrating shipping into the EU ETS demonstrates its role in advancing global maritime decarbonization. Clearer guidance on the pathway towards a global market-based mechanism and its implications for maritime actors is needed to provide certainty for future investments and commitments.

CASE 2. MOTORWAYS OF THE SEAS

Governance strategy: Case 2 focused on possibilities of strategically located ports in Europe to deliver the EGD ambitions for cleaner, more efficient and digitally enabled maritime transport. The POV for developing the strategy was the need of port authorities for interoperable digital governance systems with clear data-sovereignty rules to securely share operational and emissions data and drive cross-border collaboration. The Case suggests establishing a European Federated Maritime Data Governance Framework**,** building on existing systems and platforms. The framework creates a trusted and neutral coordination mechanism in which ports, shipping companies, logistics providers, shippers, energy providers, and public authorities can exchange operational and environmental information while retaining control over their own data. The ultimate objective of the framework is to improve supply-chain efficiency, support decarbonization, enhance resilience, enable Just-in-Time operations, and facilitate compliance with EGD requirements. The strategy involves eight key recommendations (see Part B/Case 2).

Identified Risks: Insufficient stakeholder participation, driven by an unequal distribution of costs and benefits, resource constraints, organizational capabilities, or digitalization reinforcing existing inequalities could undermine the framework's expected benefits. Political fragmentation is a significant implementation risk for the strategy, and data governance may involve disagreements on common rules and standards. A risk is also that trust remains fragile and organizations are reluctant to share commercially sensitive information unless governance arrangements are viewed as neutral and transparent.

Case Reflection through the MLCMG Lens: The governance strategy aligns with the MLCMG model particularly through its focus on strengthening collaborative dynamics to respond to a lack of trust, concerns over data ownership, commercial sensitivities, and uncertainty regarding who benefits from data sharing, all of which hinder interoperability. It also addresses institutional attributes. Fragmented governance arrangements, divergent standards, unclear responsibilities, and weak coordination across jurisdictions were identified as key obstacles to digital and environmental innovation. The strategy reflects e-governance by enabling information sharing and facilitating effective interventions and actions such as Just-in-Time arrivals, emissions monitoring, supply-chain visibility, and operational optimization. The strategy contributes to governance capabilities by addressing challenges that span ports, countries, and sectors; enabling faster and better-informed decision-making; creating feedback mechanisms and performance monitoring systems, and; introducing new forms of cooperation.

Strategy types: The strategy primarily contributes to the creation of alternative solutions. Rather than prescribing a specific technological solution or regulatory intervention, it addresses persistent governance challenges related to trust, data ownership, collaboration, and interoperability across the European maritime logistics ecosystem. The strategy also contains policy-making components, as several of its recommendations target existing European and national governance processes. In addition, elements of enhanced experimentation are present. The strategy suggests pilot projects, demonstration initiatives, and phased implementation as mechanisms for testing governance arrangements before wider deployment.

Key messages for upscaling: A central finding of the case is that Europe already possesses successful examples of digital maritime governance. In particular, the Portuguese Janela Única Logística (JUL) demonstrates how interoperability can be achieved by connecting ports, customs, logistics operators, rail, road, and public authorities through a shared governance framework rather than through technological centralization. The experience of JUL shows that digital transformation depends on harmonized processes, trusted governance, clear responsibilities, and long-term institutional coordination. The principal upscaling message is therefore not to replicate a national model at European level, but to identify and transfer the

governance principles that have enabled successful interoperability in initiatives such as JUL. These include harmonized processes, clear responsibilities, trusted data exchange, multimodal integration and sustained institutional coordination.

CASE 3. PROTECTING SEABED INTEGRITY IN THE BALTIC SEA

Governance strategy: Case 3 focused on the development of the HELCOM Common Approach (CA) for the governance of seabed habitats in the Baltic Sea. The CA strategy proposes a comprehensive framework to address cumulative impacts, fill knowledge gaps, and support the implementation of an ecosystem-based management approach. For this, integrated spatial planning, stronger coordination across sectors, improved scientific knowledge, better data sharing, and clear institutional responsibility are required. The strategy includes nine actions that relate to strengthening the spatial approach in the protection of the seabed, addressing diffuse pressures, using active restoration, developing sector specific guidance, establishing a Common Regional Research Infrastructure, improving monitoring, data availability, and data sharing, building shared understanding with national security authorities on environmental monitoring and data, and clarifying governance and collaboration practices within HELCOM. The strategy suggests that the actions to be taken first are to review and update existing guidance on dredging, aquaculture, tourism, and coastal infrastructure, updating relevant HELCOM group workplans to include seabed integrity responsibilities, and starting discussions with national security actors concerning environmental data sharing. A key element is a proposal for new forms of collaboration and coordination among the various HELCOM working and expert groups that address seabed-related matters from their respective perspectives. For detailed strategy, see Part B, Case 3.

Identified risks: A caveat to the implementation of the strategy is that HELCOM may accept it only as an internal reference document to support the planning and implementation of relevant actions, rather than as a document guiding the work of its working groups. In addition, as HELCOM must align its seabed management with several ongoing EU processes, the evolving policy landscape may influence the viability of the governance strategy. Reduced state budgets and spending in the Baltic Sea states together with limited political support are key risks that can hinder the establishment of the proposed Common Regional Research Infrastructure. Establishing dialogue with security authorities to enable the sharing and publication of seabed data at the regional sea level may also be challenging due to the sensitivity of national security information.

Case reflection through the MLCMG lens: The governance strategy relates especially to collaboration dynamics as it proposes new ways of organizing and practicing collaboration and coordination between several working and expert groups. It also addresses institutional attributes by pursuing greater coherence in the seabed management practices of the Baltic Sea countries and aiming to enhance dialogue with security authorities, as well as suggesting improved data sharing and a new regional research infrastructure.

Strategy type: The strategy is primarily a policy-making document that proposes a governance pathway for seabed management within HELCOM's established governance arrangements. The strategy also creates alternative solutions, as it proposes new elements to already existing documents and practices, and new thinking about HELCOM's seabed management.

Key messages for upscaling: This governance strategy highlights that effective seabed management requires collaboration between a range of actors, because so many human activities cumulatively affect benthic habitats. A replicable message is that other regional seas can take up some ideas of the Baltic Sea's Common Approach to seabed management.

CASE 4. SUSTAINABLE FISHERIES IN THE MEDITERRANEAN MPAS

Governance strategy: Case 4 focused on opportunities and challenges of effective co-management of small-scale fisheries in the marine protected area (MPA) of Torre Guaceto in Italy. The POV was the need to formalize the MPA co-management including effective data and information storage and sharing about the MPA status, improved monitoring and surveillance to deal with illegal activities, and improved stakeholder participation in decision-making processes of the MPA. To support this, the case study proposes SMART (smartconservationtools.org), a data management platform that streamlines how field information is stored and reaches decision-makers. This e-governance innovation helps manage and protect wildlife and wild spaces. In the field, practitioners can use the App on their smartphones to record data about what they encounter, and track where their patrols go. Information is recorded and fed into a central database. An online server allows the transmission of data, which can then be quickly analysed, visualized, mapped, and acted upon. Standardised reports can also be configured and run with just a few clicks to ensure timely delivery of key information to decisionmakers. The tool is currently being piloted in the MPA with the MPA officials and voluntary ecological guards (VEGs) and the Torre Guaceto MPA management has begun planning the long-term implementation of the tool. For details, see Part B/Case 4.

Identified risks: The primary risk associated with SMART is a 'standalone database syndrome' with the core challenge to ensure that collected information remains operational and usable. Administrative and operational adjustments may be required to ensure that the digital transition aligns with the local management plan. Operative and technical risks during the tool calibration, piloting, and implementation include limited user literacy, devices-signal errors, and database inputs/outputs updates. In the context of Torre Guaceto MPA, a need for language translation is recognised.

Case reflection through the MLCMG lens: From the perspective of the MLCMG model, e-governance represents the main innovation and change component of the governance strategy. SMART would enhance seeing and knowing through access to maps and geospatial analysis, participation and engagement through stakeholder involvement in a wide range of activities, and intervention and action through direct contribution to law enforcement to address challenges such as illegal fishing. The strategy also addresses institutional barriers relating to the development and use of knowledge, and the lack of legal recognition of co-management actors. In addition, it enhances collaboration dynamics by its potential to improve social learning and improved stakeholder collaboration. The use of SMART may depend on actors' capabilities particularly relating to resources, both financial and human, which suggests training. However, the use of SMART can also enhance actors' capabilities to access information and make better informed decisions.

Strategy type: The governance strategy primarily creates alternative solutions by proposing SMART as an alternative to several existing digital tools and standards that fall under the top-down control of national and subregional public administrations, whereas SMART builds on co-management. Partly, it also enhances experimentation, as SMART, while largely used within non-marine protected areas has limited implementation within marine protected areas. The implementation of the SMART tool in Torre Guaceto MPA provides an important context to experiment and determine its feasibility and usability, and the actions and processes needed to make it work.

Key messages for upscaling: SMART is envisioned to be used or experimented within other Italian MPAs with a focus not only on fisheries like in this case, but also on marine plastics/litter and other forms of pollution or illegal activities, raising awareness among users of the MPA and guiding potential intervention. The adoption of this e-governance strategy can be scaled up through the inclusion of ecological monitoring programs and complementary surveillance instruments such as drones and cameras installed on boats to detect illegal actors.

CASE 5. FLOATING WIND IN THE CELTIC SEA

Governance strategy: Case 5 focused on the governance challenges of offshore wind development in the UK's Celtic Sea, one of the world's largest floating offshore wind (FLOW) project pipelines. The POV of the strategy development related to the need for a single unified voice for Celtic Sea FLOW and improved collaboration, coordination, and alignment across the region. The governance strategy offers a pathway for aligning national FLOW ambitions with regional priorities, enabling a more collaborative approach and drawing upon the region's diverse knowledge, expertise, and capabilities to advance FLOW ambitions. A central feature of the governance strategy is the creation of a Celtic Sea FLOW governance body. The strategy consists of four objectives: 1) Establishing a shared Celtic Sea identity and vision for Celtic Sea FLOW; 2) Defining the overall mandate of a regional FLOW governance body; 3) Determining the design of the regional FLOW governance body, and; 4) Operationalising the governance body. Each strategic objective is associated with practical actions described in Part B/Case 5.

Identified risks: Improved governance of FLOW may accelerate deployment, generating a risk of public opposition to FLOW due to high development costs and associated electricity price increases, negative consequences for the fishing industry due to displacement from fishing grounds, and inadequate investment in supporting maritime infrastructure and supply chains. Potential risks also include disruption experienced by coastal residents during construction phases, as well as adverse impacts on tourism, local heritage values, community identity, vulnerable species and habitats, and procedural justice. Recent domestic political developments related to devolution could lead to further governance fragmentation. Limited access to sustainable sources of funding is a major risk to the adoption and implementation of a new regional governance approach. Change in leadership in the Celtic Sea Cluster that supports the Celtic Sea FLOW presents a risk to the stability of the Cluster and its capacity and willingness to take on a regional leadership role on the governance of Celtic Sea FLOW.

Case reflection through the MLCMG lens: The strategy is primarily concerned with the collaboration dynamics and institutional attributes components of the MLCMG model. A new Celtic Sea FLOW regional governance body would enable its members to identify individual and shared interests, articulate common objectives, and build mutual trust and understanding, and thereby surface underlying tensions, competing perspectives, and areas of disagreement. This would enable them to identify trade-offs, reconcile competing interests, and develop more adaptive and collaborative approaches to decision-making. Defining and operationalising institutional attributes such as mandate and design of the governance body would enhance capacity for joint action by creating the conditions necessary for sustained coordination and collective action across governance scales, enabling members of the governance body to work towards the delivery of a shared vision.

Strategy type: The strategy focuses on the creation of alternative solutions as it seeks a new way of approaching coordination and collaboration challenges within an established governance arrangement. It also incorporates elements of enhanced experimentation by setting out a roadmap for the formation of a regional Celtic Sea FLOW governance body to be co-designed by different types of actors who own the proposed actions.

Key messages for upscaling: The case has four main upscaling recommendations:1) Embed regional governance into the broader national offshore wind governance architecture to enhance opportunities for securing regional environmental, economic, and social value from offshore wind development and to provide a connection between governance levels; 2) Secure public acceptance through improved stakeholder participation and increased transparency of decision-making; 3) Foster social learning and reflexivity amongst governance actors, and; 4) Adopt a sea-basin governance approach, to provide an opportunity for collaboration across international borders to better meet common needs and challenges.

CASE 6. ENERGY ISLANDS DENMARK

Governance strategy: Case 6 focused on identifying how large-scale innovative energy solutions like Energy Islands (EIs) can contribute to EGD decarbonisation goals while addressing the interconnected challenges of their development and implementation. It developed a strategy for successfully implementing an EI in the Baltic Sea (Bornholm), considering challenges of procedural justice, legitimacy, and place-based engagement, defined as the POV. The planned deployment of the EI culminated in a policy problem with identified impact on a variety of stakeholders, physical spaces and environments. The strategy has two objectives: 1) Understand the interconnective nature of EI-related challenges, policies; and actions, and; 2) Employ a clear, modular structure that considers the complexity while leaving the option to readdress if needed. In sum, an identified policy problem (need for renewable energy infrastructure upscaling) promoted an identified solution (EIs and Offshore Wind Power (OWP)), which is institutionalized via decision-making. This solution is disseminated to non-governmental actors who are responsible for employing it in praxis. There are technological, environmental, and planning aspects to be considered. Should the employed solutions not be fit for purpose, they would return to the policy drawing board for reiteration. Otherwise, they will go for testing and implementation. See Part B/Case 6 for full strategy.

Identified risks: Key risks include a lack of industry engagement in OWP development and geopolitical tension, each involving consequent pitfalls. Failure to foresee these pitfalls may lead to new issues. Managing these new issues may require additional resources. There-fore, a holistic overview and involvement of various perspectives in planning is necessary.

Case reflection through the MLCMG lens: The strategy relates to the institutional attributes of the MLCMG model as it targets barriers and enablers of policy adaptations. For example, economically driven measures to increase industry engagement may create trade-offs with national economic, environmental, and social considerations. Collaborative dynamics similarly play a key role, considering the large network of actors directly or indirectly involved with the EI. Governance capabilities relate to stakeholders' problem management strategies. It was found that industry and governmental actors are well-established and have resources to engage with and solve problems deploying sustainable solutions, whereas local actors report a lack of such resources. However, external circumstances, e.g., economic conditions, geopolitical tensions and/or changes in established policies create barriers for engagement regardless of the stakeholders' available resources.

Strategy types: Decision-making in the Baltic Sea EI case has been rushed due to an immediate need for sustainable energy solutions caused by perceived external threats and thus comes with a risk of oversight. To mitigate this, the governance strategy offers a modular approach to decision-making as a simple step-by-step guide to implement solutions. By creating alternative solutions or additions, the strategy seeks to influence recognized policies by strengthening the knowledge base in decision-making. The strategy also addresses policymaking by contributing to recognized policy processes. This requires building on the experience accrued over the past 5-6 years since the Baltic EI's initial institutionalization. The strategy possesses elements of both developing shared understanding and the development of governance pathways, as the EI implementation process includes multiple 'moving parts'.

Key messages for upscaling: The strategic objectives can be transferred to other Baltic Sea countries expecting to deploy EIs in the future, as the Bornholm EI case exists as a pilot project for inland hub infrastructure. If a structured and modular plan can be established and an overview of all components within the project can be provided, experiences in this project should be easily transferable. This, especially considering the proposed framework, should be

flexible, so that differentiating circumstances in, e.g., planning roadblocks or a shifting geopolitical situation can be quickly integrated and managed.

CASE 7. DEVELOPMENT OF OFFSHORE WIND ENERGY IN NORWAY

Governance strategy: Case 7 addressed the designation of areas for offshore wind development and the associated licensing processes in Norway. The POV was to ensure coexistence with nature when allocating areas for offshore wind development. The proposed strategy included recommendations within four thematic areas: 1) Establishing a shared cross-political understanding and acceptance of offshore wind energy needs through dialogue meetings; 2) Creating predictable regulatory framework conditions by agreeing to a cross-political commitment to the offshore wind goals, setting a timeline for licensing, and a clear distribution of costs; 3) Creating a holistic and adaptive decision making system that ensures sound decisions on area allocations and offshore wind technology implementation though continuous identification of knowledge needs and generation of new knowledge; and, 4) Strengthening coexistence and legitimacy through the development of clear decision criteria and/or an independent mediator in case of dissent regarding area allocation, and improved stakeholder inclusion in decision processes. Strengthening environmental authorities both with respect to their mandate and resources in protecting nature within this strategy was seen as a key. For detailed strategy, see Part B/Case 7.

Identified risks: Key risks related to thematic area 1 aiming at an agreement and commitment to offshore wind were power imbalances, a lack of capacity of municipalities to secure good local consultation processes, failures to capture minority perspectives, and that transformative change would be omitted from the dialogue process, thereby limiting discussions on alternative futures. Strict timelines under area 2 may be a risk to the quality of the consultation process. A number of risks were identified for area 3. There is a lack of capacity among government authorities to implement an adaptive decision-making system. Such a system may conflict with economic growth due to the resources needed for such a comprehensive knowledge system. Knowledge exchange across countries was proposed as part of the solution, but this can be challenged by the competitive advantage of knowledge to industry partners. The proposed less comprehensive licensing processes for demonstration projects risk compromising nature. Holistic planning would require substantial resources and capability to secure good stakeholder involvement, which is lacking within key management authorities. There are also inherent ethical and methodological limitations in enabling meaningful comparison of different values as a basis for holistic assessments.

Case reflection through the MLCMG lens: The strategy requires addressing institutional attributes relating, e.g., to mandates and resources, power relations, criteria for decision making, transparency in the use of stakeholder input, mechanisms for conflict resolution, and strengthening the development and use of knowledge. The strategy has also elements related to collaborative dynamics as it builds on establishing a shared understanding and acceptance of offshore wind. An adaptive governance solution requires strengthening governance capabilities.

Strategy type: The strategy suggests first developing a shared problem understanding from local to national level, to collaboratively agree on the need for offshore wind energy. The other elements of the strategy are largely developed within an established governance arrangement. Many of the strategy solutions aim at policymaking but still need to mature.

Key messages for upscaling: The case study highlights the importance of addressing, evaluating, and allowing for the co-existence of multiple policy goals in the context of green energy development, which requires adaptive, transparent and inclusive decision-making systems. Such systems require resources and competence to properly include stakeholders, transparency in knowledge use, clear evaluation criteria, holistic management procedures,

sufficient and long-term resources to secure knowledge production, and requirements for open sharing of data also from the industry.

CASE 8. ABANDONED, LOST OR OTHERWISE DISCARDED FISHING GEAR IN THE BALTIC SEA

Governance strategy: Case 8 addressed abandoned, lost, or otherwise discarded fishing gear (ALDFG) in the Baltic Sea, a cross-cutting and transboundary governance challenge involving multiple levels of policymaking and a diverse set of stakeholders. As its POV, the study identified a need for better coordination across governance levels. The strategy includes ten priority actions. Action 1, establishing a Baltic Sea ALDFG coordination forum, aims to bring together key actors to jointly tackle ALDFG. Actions 2-4 focus on building a shared understanding of ALDFG and consolidating knowledge and reporting to inform decision making. Actions 5-10 target gaps such as retrieval mechanisms, Extended Producer Responsibility, gear marking and labelling, port and waste management, national implementation, and ALDFG from recreational fisheries. The Case study suggests HELCOM in collaboration with key stakeholders to initiate and contribute to the establishment and activities of a regional forum on ALDFG and recommends including this action in the update of its Regional Action Plan on Marine Litter (RAP ML). See Part B/Case 8 for full strategy.

Identified risks: Risks arise from insufficient support and coordination capacity for the proposed forum, as well as inadequate involvement of actors. The suggested standardization of commercial reporting may be difficult because it is governed by EU rules and national implementation systems. Similarly, other actions such as gear-labelling harmonization or EPR best practice documents depending on processes beyond the Baltic Sea region may face political limits. Limited staff time and technical effort can limit the consolidation of knowledge into resources. Without periodic review and refinement, the strategy may remain a vision rather than an adaptive governance pathway.

Case reflection through the MLCMG lens: While addressing the institutional barrier of fragmented ALDFG governance, the proposed regional ALDFG forum primarily relates to the collaboration dynamics dimension of the MLCMG model. It enhances governance capabilities by boosting actors' capacity to respond to challenges and by enabling actors to review priorities, respond to implementation barriers, and adjust activities. These actions focus on improving knowledge and understanding of ALDFG, promoting and sharing best practices, and developing targeted strategies for actors, thereby also addressing institutional barriers related to the development and use of knowledge. The governance strategy includes an e-governance element striving for improving reporting and data-sharing to support governance and make ALDFG-related information more usable, accessible, and better connected.

Strategy type: The strategy contributes to policymaking of an established governance arrangement, namely HELCOM and the forthcoming update of the RAP ML by developing a concrete governance pathway for ALDFG in the Baltic Sea. At the same time, the strategy creates alternative solutions, as it enables prioritising or implementing actions in an iterative process. Some parts of the strategy support the understanding of transition potential. This applies especially to the recommendations on developing a shared understanding of ALDFG and consolidating existing knowledge.

Key messages for upscaling: The case study highlights the importance of better coordination across governance levels where a pollution problem is transboundary and involves a diverse range of stakeholders across the lifecycle of ALDFG. It proposes a regional forum as the first of ten priority actions part of the governance strategy and its revision cycle. Upscaling this depends on sustained support and coordination capacity, actors' capability, staff time and

technical effort to consolidate knowledge, and periodic review and refinement, without which the strategy may remain a vision rather than an adaptive governance pathway.

CASE 9. AGRIPLASTICS IN THE REGION OF MURCIA, SPAIN

Governance strategy: Case 9 addressed contestation and polarisation in the governance of agriplastic sources of marine pollution in the Marina of Cope, an important ecological landscape in the Region of Murcia, Spain. As its POV, the study identified the need to build shared understandings of the problem and solutions that could support collaborative approaches to governance. The strategy includes five priority actions. Action 1, building trust between decision-makers and the local community with a specific focus on each sector. Action 2 focused on providing recommendations to support building dialogue within the region. Action 3 recommended the creation of a co-management approach for the Marina of Cope as a solution to empower local communities and support cross-sectoral collaboration. Action 4 recommends a revision of outdated policy priorities to developing collaborative priorities which are contextually-relevant and collaboratively agreed upon. Action 5 provides recommendations to support the creation of rules which formalise these priorities and establish a clear and transparent governance regime that actors can rely on.

Identified risks: Risks primarily pertain to the sensitive dynamics within the region and the risks associated with potential issues arising which deviate from the original intention of the strategy developers. There is a risk that despite the workshops and output of this governance strategy, these sectors will still experience tensions or will not be able to identify their shared commonalities. Further, there is a risk that engaging with the topic of polarisation may exacerbate it by bringing topics to the forefront. Further, there is a risk that the information provided by the actors in trust may be misused or misrepresented once the information is available to the public, potentially further reducing trust in initiatives that seek to support dialogue.

Case reflection through the MLCMG lens: In addressing the challenges of contestation and polarisation in the management of the Marina, the governance strategy seeks to enable the capabilities of reflexivity and rescaling as a means to support the revitalisation of collaborative dynamics. It seeks to enhance the capability of reflexivity by actively engaging with each sector to listen to their realities and provide policy briefs which serve as a representation of their needs. Further, it seeks to support building shared understandings by bridging these individual needs into a common governance strategy which outlines their commonalities and opportunities for where they complement one another. Finally, it seeks to support rescaling by supporting access to the regional government of Murcia and emphasising local empowerment.

Strategy type: The strategy contributes to developing shared understandings in a governance arrangement that is only moderately established, namely the Regional Park management plan, by working with the local actors to understand their needs and from there, support the development of alternative solution that focus on collective empowerment.

Key messages for upscaling: The case study highlights the crucial role that administrations play in supporting local communities to move beyond polarisation towards common and collective approaches. This is particularly poignant for increasing cases of contestation across Europe between environmental and agricultural priorities that often lead to significant clashes with the agricultural sector. Such roles should focus on providing active spaces for listening, understanding, and cooperating with actors in which priorities are collectively agreed upon on an equitable basis.

5. CROSS-CASE FINDINGS AND LESSONS

5.1 SYNTHESIS OF GOVERNANCE STRATEGIES AND RISKS

Focusing on nine case studies representing four regime complexes, PERMAGOV developed case-specific governance strategies to foster innovation and change in marine governance in support of the EGD (and EU Ocean Pact) goals as well as national policy objectives. Table 3 summarises the main points of governance strategies 1-9. Across cases, the strategies point to the importance of collaborative governance that enables balanced participation and strengthens coordination and integration in addressing interconnected governance challenges. These processes can, in turn, enhance accountability, transparency, legitimacy, trust, and predictability in decision-making and strengthen knowledge production and use, all identified as important requirements for effective marine governance. The cases also highlight the role of e-governance in supporting these processes and qualities. Analysis through the MLCMG model and the strategy typology further helped position these findings within the broader governance context. Although all elements of the MLCMG model proved relevant across most cases, collaborative dynamics emerged as particularly critical for overcoming institutional barriers and strengthening the governance processes and capabilities needed to advance the EGD goals. The strategy typology, in its part, helped clarify the governance contexts in which the strategies operate and the functions they are intended to perform within the governance arrangements. Most strategies focused on supporting policymaking or providing alternative solutions within established governance arrangements.

However, the strategies also face institutional, coordination-related, technical, political, and resource-related risks. Insufficient stakeholder participation and support may undermine implementation, particularly where competing interests, disagreements, or lack of trust constrain collaboration. Weak coordination may, similarly, dilute implementation efforts. Data-related challenges and limitations in the functioning of e-governance tools constitute additional risks. Several cases also highlighted changes in the broader political and policy landscape, including developments beyond regional control, as factors that may affect the implementation or longer-term viability of the strategies. Finally, limited financial and human resources may constrain the capacity to put the strategies into practice and sustain them over time.

TABLE 3. SUMMARY OF GOVERNANCE STRATEGIES 1–9 AND THEIR IDENTIFIED RISKS, STRATEGY TYPES, AND MODEL COMPONENTS. THE PRIMARY STRATEGY TYPE AND MODEL COMPONENT ARE LISTED FIRST, FOLLOWED BY ADDITIONAL ONES IN PARENTHESES.

Case	Governance innovation	Main risks	Main strategy type	Main MLCMG model components
1. Decarbonizing shipping	Pathways and actions to resolve challenges relating to uneven participation of different shipping actors in decision-making, lack of transparency in ETS surcharges, and unclear accountability for	Competing interests and power imbalance between actors. Rerouting to non-EU ports to avoid ETS costs Use of inaccurate data and greenwashing	Policy making (Experimentation) (Alternative solutions)	Institutional barriers (E-governance) (Collaborative dynamics) (Governance capabilities)

	greenhouse gas emissions.			
2. Motorways of the sea	Transform fragmented and siloed digital arrangements into a collaborative and trusted maritime data ecosystem, in terms of a European Federated Data Governance Framework.	Insufficient stakeholder participation Political fragmentation Disagreements and lack of trust Resource constraints	Creation of alternative solutions (Policy making) (Enhance experimentation)	Collaborative dynamics (Institutional attributes) (E-governance) (Governance capabilities)
3. Protecting seabed integrity in the Baltic Sea	Development of the HELCOM Common Approach based on integrated and coordinated governance supported by shared knowledge and clear responsibilities	Lack of financial and political support Difficulties in collaboration with security authorities Changing policy landscape	Policy making (Alternative solutions)	Collaborative dynamics (Institutional attributes)
4. Sustainable fisheries in the Mediterranean MPAs	Technological data management platform SMART	Database isolated from decision making and operational systems	Creation of alternative solutions (Enhance experimentation)	E-governance (Institutional barriers) (Collaborative dynamics) (Actor capabilities)
5. Floating wind in the Celtic Sea	Establishment of a new Celtic Sea FLOW governance body	Public opposition Risks to other maritime sectors, culture and identity, marine ecosystems, procedural justice Political development Funding	Creation of alternative solutions (Enhance experimentation)	Collaborative dynamics (Institutional attributes)
6. Energy Islands in Denmark	Integrated and flexible implementation of the Baltic Sea EI through modular decision making that addresses interlinked challenges, policies and actions.	Lack of industry engagement Geopolitical tension Maladaptation/unforeseen consequence(s) of applied solution(s)	Between creation of alternative solutions and policymaking	Institutional attributes (Collaborative dynamics) (Governance capabilities)

7. Development of offshore wind energy in Norway	Strategy to ensure shared understanding and acceptance, predictable regulatory framework, robust knowledge production for application in adaptive decision-making system, and coexistence and legitimacy.	Uncertainty about whether environmental authorities have sufficient mandate and resources to secure nature Poor consultation process leading to power imbalance Lack of resources and capacity for implementation	Develop shared problem understanding (Policymaking)	Institutional attributes (Collaborative dynamics) (Governance capabilities)
8. Abandoned lost or otherwise discarded fishing gear	A collaborative coordination forum to improve knowledge exchange, reporting, knowledge-informed decision-making, gear management and litter prevention.	Lack of support for the proposed forum Lack of coordination Failures in reporting standardization Constraints beyond regional control	Policy making (Creation of alternative solutions) (Develop shared understanding) (Understand transition potential)	Collaborative dynamics (Institutional barriers) (Govenance capabilities) (E-governance)
9. Agriplastics in the region of Murcia, Spain	Developing a co-management strategy for the Marina of Cope premised on building reflexivity, dialogue, and trust between sectors.	Tensions between sectors not being reduced, diminishing trust in dialogue process, misuse of information shared in dialogue or co-management further deepening polarisation.	Develop shared problem understanding, empowering local actors to take collective solutions	Collaborative dynamics, Governance capabilities (reflexivity, responsiveness)

5.2 SYNTHESIS OF UPSCALABLE AND GENERALISABLE MESSAGES

The analysis across the nine case studies identified both concrete opportunities for upscaling the governance innovations and broader, generalisable messages that can support their application in other contexts (Table 4). The upscaling opportunities include scaling successful governance innovations across governance levels, for example, from the regional to the European level or from the EU to the global level; transferring integrated and coordinated governance approaches to other geographical contexts; and broadening the application of e-governance tools to new geographical areas and governance challenges and linking them with complementary instruments. In addition, the cases point to several generalisable conditions for upscaling: strengthening collaboration and inclusive stakeholder engagement to foster social learning, reflexivity and transparency; strengthening linkages across governance levels, national borders, and sectors/policy domains, through sea-basin approaches; and systematically addressing trade-offs and synergies between policy objectives and uses to facilitate their reconciliation and coexistence.

TABLE 4. KEY MESSAGES FOR UPSCALING IDENTIFIED IN CASES 1-9.

Case	Key message for upscaling
1. Decarbonizing shipping	Inclusive stakeholder engagement in decision making on shipping emissions, costs and investments EU's emission trading system to be enforced also globally
2. Motorways of the seas	Extending Portuguese JUL interoperability principles to the EU level through harmonized governance, trusted data exchange and coordinated multimodal transport systems.
3. Protecting seabed integrity in the Baltic Sea	Baltic Sea common approach to seabed management applicable to other sea areas
4. Sustainable fisheries in the Mediterranean MPAs	SMART tool relevant for other MPAs and forms of pollution or illegal activities Inclusion of ecological monitoring programs and complementary surveillance instruments in SMART
5. Floating wind in the Celtic Sea	Connect local and national levels of offshore wind governance Stakeholder participation and transparency of decision-making Foster social learning and reflexivity Sea basin governance approach across national borders
6. Energy Islands in Denmark	Structured modular plan for the implementation of EIs transferable to other Baltic countries.
7. Development of offshore wind energy in Norway	Address, evaluate, and allow for the co-existence of multiple policy goals in green energy development.
8. Abandoned, lost or otherwise discarded fishing gear in the Baltic Sea	The importance of better coordination across governance levels where a pollution problem is transboundary and involves a diverse range of stakeholders across the lifecycle of ALDFG.
9. Agriplastics in the region of Murcia, Spain	Actively address polarisation through local-level initiatives that work with the communities to listen and provide spaces to develop shared understandings.

5.3 METHODOLOGICAL CONSIDERATIONS

The methodology combining Design Thinking and backcasting was considered well suited to collaborative strategy development, providing a structured process while allowing adaptation to case-specific contexts and evolving governance challenges. It facilitated interaction between stakeholder knowledge and policy analysis and supported researchers' thinking throughout the innovation process. At the same time, the predefined stages of Design Thinking

did not always align with local realities, requiring the process to be adapted to the specific needs of each case and its end-users.

Collaboration was essential to strategy development. Stakeholder engagement was generally successful but also presented practical challenges. Established contacts with end-users and their knowledge of the study context facilitated engagement with key stakeholders. Workshops provided valuable input to strategy development, but stakeholder availability due to, e.g., organisational working practices and schedules in some cases constrained opportunities for continuous and consistent co-creation. Extensive engagement involving repeated interactions may also have contributed to stakeholder fatigue in many cases. Smaller groups allowed more time for focused discussion but also meant that fewer perspectives could be incorporated. Language barriers also emerged as a challenge to collaboration.

Time constraints were considered to restrict the depth of discussions and interaction in stakeholder workshops, and in many cases, time ran out before all perspectives were clarified. Similarly, stakeholder workshops conducted online were considered to restrict interaction. More extensive in-person engagement was considered to enable deeper discussion, but this had to be balanced against stakeholder availability and the risk of participation fatigue. Overall, the cases demonstrate the need to balance breadth of participation, depth of engagement, and the practical constraints on stakeholders' time when designing collaborative strategy development processes.

6. CONCLUSIONS

This deliverable (D6.2) is an output of four years' research and co-development work carried out in PERMAGOV. It presents governance strategies developed for nine case studies representing four regime complexes to support EGD and EU Ocean Pact goals and national policy objectives, together with the processes through which the strategies were developed. The work followed a flexible methodological approach combining design thinking and backcasting underpinned by the multi-layered collaborative marine governance model developed in the project and a strategy typology adapted for the project. The strategies were tailored in collaboration with end-users and stakeholders to address their needs. The engagement of end-users as full consortium partners played an important role in facilitating collaboration with stakeholders. As implementation falls beyond the scope of the project, it is hoped that the end-users will take forward the governance strategies and further develop and implement the strategic pathways and actions in their respective cases. PERMAGOV is now in its final phase, with two further deliverables still to be completed. D6.3 focuses on marine e-governance solutions for the cases. Finally, D6.4 translates the lessons learned in PERMAGOV into recommendations in the form of policy briefs targeted at the four regime complexes. All strategies presented in this deliverable are also available separately on the project website https://www.permagov.eu/results, where they may reflect further developments since the preparation of this deliverable.

PART B: FULL CASE-STUDY REPORTS

1. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 1: DECARBONISING SHIPPING IN THE EU

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1.1. SHORT CASE DESCRIPTION

Maritime transport serves as an essential mode of global trade, but it is contributing increasingly to global greenhouse gas emissions currently at about 3%. In the EU, maritime transport represents around 14% of total transport emissions, or around 4% of total EU CO2 emissions. The EU emissions trading system (EU ETS) is the cornerstone of EU's climate policy, seeking to promote competitive, resource- and energy-efficient, low-carbon solutions and to achieve climate neutrality by 2050. Directive 2003/87/EC (the 'ETS Directive') lays down the rules for greenhouse gas (GHG) emission allowance trading within the EU. It aims to align with various objectives of the European Green Deal, but its effectiveness remains an open empirical question. Through the "Fit for 55" package, the EU aims to cut net GHG emissions by at least 55% by 2030 compared to 1990 levels. The "Fit for 55" package included a revised EU ETS that covers GHG emissions from maritime shipping from January 2024. EU ETS provides a clear signal of the EU's commitment to reduce GHG emissions from international shipping. Currently, the EU ETS covers emissions from ships of 5000GT. EU ETS utilizes the key principles of the Monitoring, Reporting and Verification (MRV) system, which is the foundation of accounting for the EU GHG emissions from ships. Other related maritime decarbonisation policies include; FuelEU maritime, which sets GHG intensity targets and fuel standards for shipping and the Alternative Fuel Infrastructure Regulation (AFIR), which aims to increase the availability of shoreside infrastructure (e.g., electricity, green fuel storage facilities, etc.) in ports (Lagouvardou and Psaraftis 2022[6]). Given maritime transport's international nature, regulating emissions in the sector presents unique challenges. Maritime decarbonization via EU ETS involves two complicated set of implications – legal implication (i.e. meeting regulatory requirements) and commercial implication relating to the cost exposure for emitting GHG from shipping, with differing interests between organisations, states and other relevant actors. There are also risks of carbon leakage where ships may call at non-EU ports to evade the full cost associated with their emissions.

The European Commission's latest proposals bring important changes to the EU maritime decarbonisation regime; more vessels could fall under the EU ETS as the policy is proposed to be extended to general cargo and offshore vessels 400-5,000GT; and to minimise duplicated reporting obligations for ETS and FuelEU are merged in the relevant MRV compliance cycles. These measures could reduce ETS evasion and help create one common data foundation and workflows but also places greater emphasis on voyage-level emissions data accuracy.

Still, the designation of shipowners as 'responsible company' for reporting and meeting the cost of their ship's emissions creates uneven decision-making power between shipowners and other maritime actors such as cargo owners/ shippers who usually pay for the ETS costs. Thus, there is a strong feeling that shipowners' lobbying power carries a lot of weight on authorities. This is exacerbated by the lack of transparency that currently exists in the ETS maritime surcharges, which are usually passed on to shippers/cargo owners without clear explanations or justification for it (Adjei et al., 2026[7]). The main governance challenges identified included:

[6] Lagouvardou, S., and H. N. Psaraftis. 2022. Implications of the EU emissions trading system (ETS) on European container routes: A carbon leakage case study. *Maritime Transport Research* 3:100059.
[7] Adjei, M., Van Leeuwen, J. & Pereira, H. Towards decarbonising shipping: Governance challenges and barriers to the implementation of EU emission trading system (ETS). *Maritime Studies* **25**, 23 (2026). https://doi.org/10.1007/s40152-026-00476-x

- *Uneven participation of the maritime value-chain decision-making.*
- *Lack of accountability for greenhouse gas emissions*
- *Disagreements on emission surcharges in maritime shipping.*
- *Lack of coordination between EU and non-EU maritime regulations and actors*

Main Point of View (POV)[8] selected for ideation

Shipper/cargo owners need to understand how their concerns are being addressed and weighted in decision making processes at the EU level, because there is a strong feeling that shipowners' lobbying power carries a lot of weight on authorities than shippers/cargo owners. Upon further discussions, the first three governance challenges above were selected in developing the governance strategy.

1.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 1

The governance strategy development process involved different methods. We utilised the design thinking process and backcasting methodology involving in-depth analysis of data from interviews and desk-based research particularly in the baseline assessment phase. The vision, solutions and priorities and sustainability assessment phases involved two interactive workshops. The first interactive workshop was a joint workshop organized in October 2025, between PermaGov cases 1 and 2, both under the maritime transport regime complex. Workshop attendees included participants across the maritime value-chain such as shipowners (European Community Shipowners Association (ESCA), cargo owners/shippers (European shippers Council (ESC), who are also key partners in the PERMAGOV project, Ports, and environmental NGOs. Discussions focused on digitalisation and decarbonisation in the maritime supply chain, with focus on the role of shipping and port actors. Participants identified three key governance challenges**:** Lack of stakeholder engagement and trust, lack of data quality and commercially useful near-real-time per voyage cost information, lack of data governance strategy (with questions such as: Who owns the data? Who can access it? What data must be disclosed? At what level of aggregation? How is commercially sensitive information protected? Who verifies the data?).

Collectively, participants envisioned a future where carbon emission data transparency becomes a driver of innovation, collaboration, and commercial opportunity within the maritime ecosystem. This was an important validation of the governance challenges identified for case study 1 and was an important source of data for discussions in the second interactive session.

The second workshop organized in June 2026, also included actors in EU maritime shipping particularly those with interest in the EU ETS policy including the European Shippers' Council (ESC) – a project partner of PermaGov, Transport and Environment (eNGO), Evofenedex, DG MOVE and relevant academics. The main aim of the second workshop was to co-produce (e-)governance interventions/strategy for enhanced performance of EU marine governance particularly relating maritime shipping decarbonisation to achieve EU Green Deal objectives.

[8] Point of View refers to the actionable problem statement or targeted problem formulation where the needs of the actors and the insight behind why they have this need is formulated.

We started discussions with a desirable future: 'a transparent and equitable maritime shipping decarbonization in which actors participate in decision-making, with cost and data transparency'. Discussions of the governance strategy focused on two main topics**:**

(1) How the governance challenges that inhibit transparent and equitable maritime decarbonization within the EU can be addressed[9].
(2) Specific focus on the protocols for the development of an ETS surcharge calculator which can be acceptable and accessible to all relevant stakeholders.

1.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

1.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

Previously, annual emissions data was adequate for compliance with EU MRV. The introduction of EU ETS in shipping now means that precise per voyage data is needed for setting emission allowances year-round. Daily reporting, verifications and corrections are essential as annual inaccuracies tolerable for EU MRV compliance can now lead to significant financial discrepancies. There is too much uncertainty about what is actually emitted, actual cost involved and who pays, and no single source of data, fuels and technology for the future transition of the shipping industry. The unequal power relations (e.g., resources, technology, etc.) among maritime shipping value-chain actors coupled with maritime transport institutional attributes that hinder stakeholder participation in decision-making for greenhouse gas emissions, accountability and transparency in EU ETS surcharges, creating disagreements and uncertainties about the long-term role of EU ETS in maritime shipping decarbonization.

The governance strategy provides pathways and actions to be undertaken to address the governance challenges and institutional barriers that hinder fairer and transparent maritime shipping decarbonization. That is, how the institutional barriers relating to uneven participation of maritime shipping actors in decision-making, the lack of transparency in ETS surcharges and unclear accountability for greenhouse gas emissions can be addressed. In discussing the pathways, we also examined the (potential) roles of relevant maritime actors, the level of intervention, and the timescales (short-term, medium-term and long-term) to address the identified governance challenges and barriers. The governance strategy consists of three (3) Strategic Pathways and ten (10) Action lines.

[9] EU ETS as a policy towards EU maritime decarbonization targets both EU and non-EU ships moving in and out of EU ports. This means that its implications require taking into account the regional and global level interests. '*Lack of coordination between EU and non-EU maritime regulations and actors*' was identified as a key governance challenge during the baseline assessment but was not included in the workshop discussions. Through engagements between the academic partners (WU) and ESC as project partner, we agreed that some of the governance pathways may be more feasible within the EU than others and discussing governance challenges related to non-EU actors could switch discussions to IMO level issues which would be difficult to manage.

Strategic pathway 1: ***Involve the full-scale value-chain in maritime decarbonization decisions and practices***

Actions

- There is a need for the *Commission* to move beyond ship-owner centric governance model by legally and commercially integrating cargo owners, fuel suppliers, and charterers into decision-making. That is; to deal with stakeholder participation in decision-making, policy makers must ensure a balanced representation in decision-making processes. The European Sustainable Shipping Forum already includes diverse stakeholders in policy consultations but should include transparency requirements and key performance indicators. A balanced stakeholder representation as well as their influence on decisions such as fuel and technology choices would be crucial in building trust, confidence and a high level of certainty in the future of decarbonization policies, technology and green fuels.

- Shipowners/Carriers must ensure early involvement of stakeholders including cargo owners, fuel providers and port authorities in decarbonization planning.

- Create knowledge sharing and collaborative research and development platforms. This also includes enhanced private-led initiatives and collaborations to accelerate green fuel and vessel demonstrations. There already exist platforms such as green shipping corridors and Zero Emission Maritime Buyers Alliance (ZEMBA), which should be encouraged and supported. Such collaborative platforms would also ensure that smaller shipping companies with limited resources and leverage to negotiate would be supported by virtue of their involvement in such coalitions. It would also enhance information sharing, transparency and overall stakeholder participation in decisions and practices towards maritime decarbonization.

Strategic pathway 2: ***Charter parties/contracts with clear ETS cost sharing process***

Actions

- Establish clear rules (e.g., in charter parties/contracts) indicating who pays what and how much. That is, new charter parties/contracts should clearly state ETS cost and payment responsibilities, and already existing contracts should be updated to enable cost-sharing between cargo owners and shipowners, and other actors. This should be done by the contract parties (Carriers/shipowners, cargo owners, etc.).
- Policy makers should make clear rules that differentiate between Cargo owners and carriers for their role in decarbonization policies such as EU ETS and related policies (e.g., Fuel EU maritime, etc.). This would ensure that whilst charter contracts may be independently agreed between these parties, they are formed within a particular framework – a rule which clarifies the roles of each entity and makes every actor partly responsible for decarbonization instead of making one actor (shipowner) as primarily responsible.

Strategic pathway 3: *Standardize shipping Emission Estimation and Cost Calculation*

Actions

- Develop an accessible ETS emission and cost calculator tool or platform where actors can agree on ship emissions and cost per voyage and at a relatively short time than EU MRV currently provides. Whilst there have been ongoing discussions and processes at the EU level about developing a methodology or a tool for timely ship emissions and cost accounting, this has not yet materialised, and shipping emissions data still depends on the EU MRV. As PermaGov project partner, ESC is developing an industry-led ETS surcharge calculator (IT-tool). If this tool becomes accepted as the standard tool for ship's ETS surcharge calculation, it could be upscaled into an EU-level intervention.
- Mandatory data sharing on fuel efficiency by shipowners on ship's actual fuel consumption, cost and justification for corresponding surcharges.
- Regular and transparent carbon performance audits. Policymakers should address the issue of unfair surcharges by mandating more transparent carbon performance audits (especially partial container loads) from carriers (who control most data) and linking ETS surcharges directly to vessel emissions. The current reporting from shipping companies/shipowners provides only aggregate data rather than specific emissions of information. Yet, cargo owners (especially the smaller ones with little leverage) often pay arbitrary amounts that bear no direct relationship with the actual carbon cost.
- The *Commission* should create a dedicated grievance redress of body/mechanism. That is, establish a dedicated body charged with responsibility of addressing stakeholder concerns and grievances regarding emission calculation and costs. This would ensure timely redress of conflicts and concerns at little or no cost unlike the case of going to court to seek redress. This could help build trust and fairness among actors such as shipowners and cargo owners.
- Incentives and strong technical infrastructure (for accurate and transparent calculations) and data sharing. This is a shared responsibility for all relevant actors in the maritime value-chain. The commission and its member states should provide incentives for investment into greener ships and fuels, port authorities should invest in alternative fuel infrastructure, shipowners should ensure that they purchase environmentally sustainable/green ships

Each of the above pathways contributes to enhancing transparency and fairness to maritime decarbonization by complementing each other. Hence, should not be considered mutually exclusive. However, each of them has distinct lines of action that need to be undertaken.

Timelines of actions

Participants noted existing timelines for EU ETS revision and the IMO net zero framework implementation, while highlighting the urgency of improvements to meet carbon goals, particularly given doubts about the shipping industry's ability to reach net zero by 2050. On the question of what needs to be done between now and 2030, participants indicated that;

1. Transparency, particularly relating to transparent information on emissions and costs through the development of a surcharge calculator either by the commission or an industry-led body (e.g., ESC), must be ensured **now**.

2. Followed by contracts that enable cost-sharing between cargo owners and shipowners as well as the ability to influence fuel and technology choices **from 2027.**
3. A key action needed from **2028 onwards** is a shared accountability across the maritime value chain.

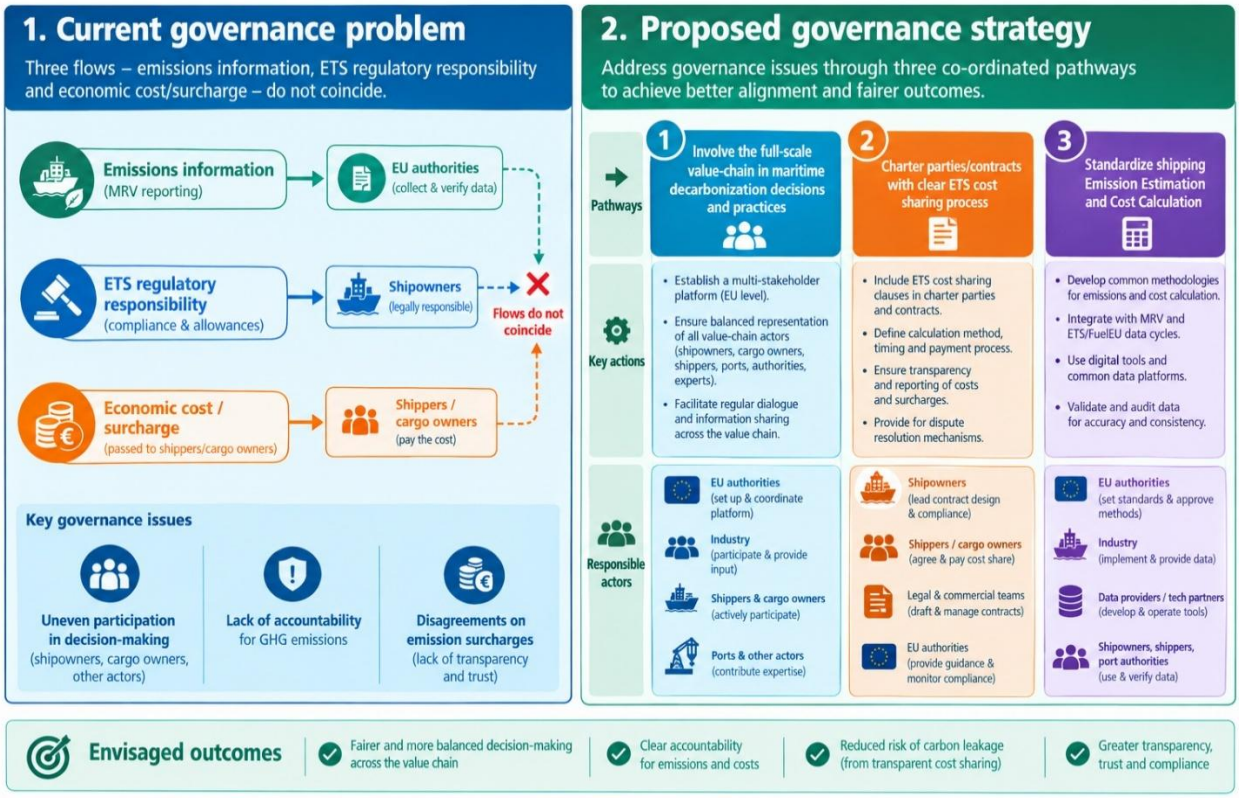


Figure 1: An illustration of the key governance challenges and proposed governance pathways and actions towards transparent and fairer maritime decarbonisation.

1.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

The proposed governance strategy and pathways align closely with various components of the PERMAGOV model, that is, the Multi-Layered Collaborative Marine Governance (MLCMG) model through its focus on overcoming institutional barriers, strengthening collaborative dynamics, and leveraging e-governance as an enabler of change and innovation.

The governance strategy primarily seeks to address the institutional barriers in maritime transport governance that inhibit transparent and fairer maritime shipping decarbonisation. First, ***Involving the full-scale value-chain in maritime decarbonization decisions and practices*** it lays the foundations dealing with institutional barriers associated with:

1. ***Actor eligibility*** – relating to shipowner-centric nature of EU maritime shipping governance where shipowners are considered primarily responsible for decarbonisation policies such as EU ETS and other related policies. Implementing a full-scale value-chain approach means that actors such as cargo owners who usually pay for the cost of shipping emissions participate in such decisions.

2. ***Actor control/power*** - A balanced stakeholder representation and influence in decisions such as ship routing, fuel use and technology choices could mean that the inherent power asymmetry that tend to enable major actors in maritime shipping to make unilateral decisions could be checked. This could also mean that the voices of less resourced shipping companies could be heard and addressed.

An important related institutional barrier that could be addressed is improved transparency and ***Actor accountability***: through the development of ***shipping Emission Estimation and Cost Calculation***. The creation of this calculator and its general acceptance as the main source of truth in shipping emission and cost calculation could mean that cargo owners for example, could seek clarification from shipowners on their ETS surcharges and better negotiate. Whilst the calculator itself may not address disagreements, it would provide a credible source of truth based on which different actors could be held accountable.

In addition, the establishment of a dedicated body charged with responsibility of addressing stakeholder concerns and grievances regarding emission calculation and costs could provide an important ***conflict redress mechanism*** for resolving conflicts and stakeholder concerns related to ETS surcharges. The establishment of a body like the Federal Maritime Commission in the US, would ensure timely and less costly conflict redress process rather than seeking redress in the court with its long bureaucratic process (Adjei et a., 2026).

Relatedly, the governance strategy also strongly reflects the **E-Governance** component of the MLCMG model. The proposed ***shipping Emission Estimation and Cost Calculator*** *is expected to be a digital tool that can assist stakeholders in shipping emissions and cost calculation. The emission calculator is intended as a key e-governance component related to* ***s*****eeing and knowing**, by enabling actors to access more accurate and timely information shipping emission and the associated cost. As earlier indicated, the tool will also support ***participation and engagement*** by allowing key actors such as cargo owners to not only seek explanations for surcharges but would also contribute to and benefit from shared information systems, which enhance transparency. Finally, ETS calculator would facilitate ***interventions and actions*** by enabling actors such as cargo owners make decisions related surcharges, and the type of ship to contract depending on their relative ETS cost surcharges, the ship's emission capabilities, among others.

The governance strategy as partly relates to both ***Collaboration Dynamics*** and ***Governance capabilities*** components of the MLCMG-model. The strategy supports the creation of knowledge sharing and collaborative R&D platforms such as Green Shipping Corridors and private-led initiatives such as Zero Emission Maritime Buyers Alliance (ZEMBA). ZEMBA's buyer-driven forums foster open exchanges between shippers and shipowners to align procurement criteria and aggregate demand for zero-emission vessels. These forums exemplify ***principled engagement*** by providing structured platforms for stakeholders to negotiate shared goals, knowledge, resources and establish mutual expectations, with the potential to build trust across the supply chain, which may not be available to individual actors, especially the less resourced organisations. However, with stakeholders competing interest in maritime shipping, there are likely to be misunderstanding, competition, and increasing mistrust between actors. The evidence of ***shared motivation*** lies in stakeholders' collective capacity to navigate these tensions to reinforce trust and legitimacy across the shipping value chain. The case of ZEMBA suggests an emerging web of interaction aimed at joint problem-solving. The shared motivation to deploy zero-emission shipping solutions, enables principled

engagement of shipowners, cargo owners and other actors in the value-chain, through this platform would translate into ***joint capacity*** to bargain with shipowners, maximize emissions reduction and generate economies of scale, beyond what individual efforts could achieve (See Coelho et al., 2026[10]).

In terms of governance capabilities, the governance strategy proposes improved information sharing through stakeholder participation in decision-making and establishment of grievance redress mechanisms. These actions relate to ***Reflexivity*** as they provide opportunity for actors such as shipowners to understand, reflect and redefine the complex governance challenges associated with the ETS policy such as surcharges. Hence, it also related to actors' ***Agility and responsiveness***, that is their ability to adapt and reposition themselves in response to the grievance expressed by other stakeholders. Finally, the creation of an ETS calculator, amid the resultant potential challenges, relates to ***revitalization***, which would be considered the most important governance capability component.

1.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

Maritime shipping has a well-established governance arrangement with organized actors, discourses, rules of the game, resource and power driving its decarbonization agenda. The proposed governance strategy primarily applies to the policy-making aspect of the governance strategy matrix. It aims to develop governance pathways that address challenges associated with the EU's decarbonization policies. Specifically, the governance strategy targets issues relating to stakeholder participation in decision-making processes, transparency in the EU ETS policy implementation process, and mechanisms for improved accountability. These interventions aim at strengthening the EU decarbonization policies particularly related to EU ETS.

The governance strategy also partly focuses on enhancing contextualized experimentation and the creation of alternative solutions through the development of ETS emission calculator. Whilst there have been ongoing discussions and processes at the EU level about developing a methodology or tool for timely determination of ships' emissions and cost, this has not yet materialized. The development of ESC's emission calculator provides a crucial opportunity to experiment with how such a common platform for emission calculations can be implemented and the associated challenges. This could become an important platform for experimenting with what could become the main acceptable source of ships emissions and cost calculation. It could also create an alternative solution to the already existing carbon emission calculators which often show unclear parameters, data security concerns, and come at a high cost for their use.

1.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

A transparent and fairer maritime decarbonization governance through improved stakeholder participation in decision-making, updated contractual agreements that enable cost-sharing,

[10] Coelho, N.F., Adjei, M., van Leeuwen, J. *et al.* Collaborative governance in maritime transport: policy arrangements under the European green deal. *Maritime Studies* **25**, 49 (2026). https://doi.org/10.1007/s40152-026-00504-w

and the development of ETS surcharge calculator could have several sustainability implications, including benefits and risks:

SDG 9: Industry, Innovation & Infrastructure

An ETS calculator in shipping is a digital innovation that can support greener logistics infrastructure and more efficient maritime transport system. It can also help businesses integrate emissions information into logistics and supply-chain decision-making. However, ETS surcharge calculator alone does not give full environmental cost of emissions as other climate impacts and regulations (e.g. FuelEU maritime) may be ignored. This is why the newly proposed amendment of ETS by the commission includes proposal to deliver a simplified regulation for operators complying with the EU ETS and FuelEU obligations by merging the relevant MRV compliance cycles[4] to ensure that all relevant data are collected under the same MRV system[5].

SDG 12 – Responsible Consumption & Production

An ETS surcharge calculator could give shipowners/carriers, cargo owners, insurers, and other maritime actors information to compare the environmental impact of different shipping choices (e.g., transport modes, routes, vessel types or fuels) and potentially choose lower emission options. Nevertheless, EU ETS maritime accounting has specific rules on which voyage emissions are covered, so a simplified calculator that allocates emissions based on averages instead of actual activity data or verified vessel/fuel data can reduce accuracy due to over- or under-estimate the liabilities. Thus, an accurate surcharge calculator requires

SDG 13: Take urgent action to combat climate change and its impacts

The calculator could enable the measurement, monitoring and consequent reduction of CO_2 emissions and cost from maritime transport. However, this could lead to what is popularly known as greenwashing where shipping companies may use emission calculator outputs as indications of “green” or “carbon-neutral” contribution, creating misleading sustainability messaging. This tool could become a marketing tool instead of climate solution.

SDG 17: Partnership for Goals

Multi-stakeholder partnerships, technological innovations and capacity building of the full maritime value chain through open forums for discussions, knowledge sharing and joint action could lead to enhanced maritime decarbonization governance. However, with the inherent competition in maritime transport value chain, such partnerships could create free riders where some organisations (especially the less resourced) may not make the effort to contribute to the partnership process but benefit from other’s efforts. In addition, larger maritime shipping organizations/companies who contribute more would dominate the collaborative process and ultimately determine the cause of actions and create the impression as though they were generally agreed by all stakeholders. The inherent competition among maritime transport actors makes such risks very crucial as some stakeholders may be sidelined in the partnership towards maritime decarbonization.

Political

Whilst the EU ETS is considered a cornerstone of EU climate policy which also positions the EU as a leader in global maritime decarbonization, the implementation of an EU-focused decarbonization policy for a global challenge of carbon emission from shipping has both socio-economic and political implications. The risk of carbon leakage could persist as ships may call at non-EU ports to reduce their cost regardless of the internal mechanisms of surcharge

calculation. The risk is that this may create competitive disadvantage for nearby EU ports which would compromise not only the environmental integrity of EU ETS and related policies but create uncertainties regarding the future of such policies in maritime transport governance.

Resource-related

Shipping companies often use data from multiple systems: MRV systems, fuel procurement databases, among others. As such, the risks of inaccurate data and data related risks can lead to incorrect surcharge calculations (over-under estimation), exposing the shipowner to financial losses. There is the need for carrots (i.e., incentives/rewards) for carriers and other data providers to ensure that the data needed to produce accurate and timely calculations are provided. Maritime actors such as carriers must know the benefits of sharing such ship emission data and those who provide timely and accurate data should be rewarded as inaccurate data could jeopardize the system. Strong technical infrastructure and expertise would also be required to run the surcharge calculation tool, provide adequate data security and privacy for accurate and transparent calculations.

1.4. UPSCALING

Advancing ocean research, knowledge, skills and innovation

The implementation of EU decarbonisation policies such as EU ETS is complicated by the complexity of actors and their relations in the maritime value-chain. Different actors within the maritime value-chain directly influence ship operations and GHG emissions: Cargo owners, shipowners, charterers, port authorities, technical and commercial ship managers, among others. The complexity of the maritime value chain, i.e. the inter-actor relationships and cost distribution, is at odds with the EU ETS focusing only on the shipowner/carrier as the 'responsible company' (Flodén et al. 2024[11]; Adjei et al., 2026). Thus, a full-scale value chain approach where each actor takes active part in decisions relating ships emissions, cost and investment directions would be crucial in dealing with the governance challenges in the implementation of EU's maritime decarbonization policies such as EU ETS. This would require two main actions:

i. Joint research, innovation, and knowledge/data sharing platforms. As already indicated, joint platforms such as ZEMBA, green shipping corridors, port community systems, among others would be crucial in ensuring shared understanding and enhance actors' capacity for joint action towards maritime decarbonization.

ii. Enhance the role of digitalization in maritime decarbonization. Whilst there exist several digital tools within maritime governance system and specifically for decarbonization, their parameters are often unclear, with high cost of use. Technology providers across the value chain must operate under open and regulated frameworks, not black-box models.

[11] Flodén, J., Zetterberg, L., Christodoulou, A., Parsmo, R., Fridell, E., Hansson, J., … Woxenius, J. (2024). Shipping in the EU emissions trading system: implications for mitigation, costs and modal split. *Climate Policy*, *24*(7), 969–987. https://doi.org/10.1080/14693062.2024.2309167

iii. A dedicated body charged with the responsibility of addressing grievances of actors in a timely and cost-effective manner just like the Federal Maritime Commission in the US.

Strengthening EU Ocean diplomacy and international ocean governance

Ultimately, a global maritime decarbonization policy beyond those proposed by the EU would be the most suitable to deal with global maritime shipping decarbonization. Yet, powerful countries such as Saudi Arabia, Russia, and more recently the US, have resisted the implementation of global MBMs, including those proposed as part of the recent, IMO Net Zero framework. The EU took a leading role in promoting the reduction of GHG emissions from shipping by including shipping on its decarbonization agenda through EU ETS. The EU should, however, clarify its position on delays in having a global MBM and how the implications on maritime actors, especially within Europe, would be dealt with to bring certainty to future investments and commitments.

1.5. REFLECTIONS ON THE METHODOLOGY

The design thinking process and back-casting methodology were very relevant for such a collaborative project, and the process instructions were clear.

Starting the governance strategy development with a definition of desirable future or end-state of the governance arrangement meant that the research team and participants had a definite target for the defined governance strategies and action lines. The stepwise approach of back-casting method served as a guiding tool for systematic analysis of potential action lines and risks, enabling early identification of alternative solutions.

In addition, by designing a target vision, it became easier to clarify and prioritize more relevant actions, their feasibility and level of urgency/timelines, leading to more robust future strategies.

Our two-level stage of strategy development – regime complex level workshop and case study specific study workshop provided the case study team with broader understanding of the linkages and underlining challenges in the broader maritime transport governance and how they related to the specific issues of the two case studies.

Notwithstanding, the collaborative process often involved complex back and forth engagements with stakeholders and research participants for validation which created concerns of stakeholder fatigue. The prioritization of governance pathways was not very difficult as participants were quite clear about what needed to be done. However, defining and selecting specific action lines and their validation were usually difficult. Also, most of the stakeholder workshops were organized online, and we often struggled with time limitations - a more in-person workshop could have led to more detailed discussions and engagements. Our in-depth interviews served as backups in instances where more data was needed.

2. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 2: MOTORWAYS OF THE SEAS

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2.1. SHORT CASE DESCRIPTION

This case study originated as an inquiry into the governance of the European Union's Motorways of the Sea (MoS) initiative, first introduced in the Commission's White Paper European Transport Policy for 2010: Time to Decide (2001)[12] and subsequently incorporated into the Trans-European Transport Network (TEN-T) framework.[13] The original focus was on the regional implementation of this initiative in the North Adriatic and, in particular, on the collaborative governance arrangement established through the North Adriatic Ports Association (NAPA). As the research progressed, however, the broader policy landscape evolved considerably. The sectoral logic of Motorways of the Sea was gradually embedded within a wider vision of integrated maritime governance, reflected in the EU's Integrated Maritime Policy (2007)[14] and the Maritime Spatial Planning Directive (Directive 2014/89/EU)[15], which established a framework for the coordinated management of European maritime space.

The emphasis on maritime transport governance further expanded with the adoption of the Sustainable and Smart Mobility Strategy (2020)[16], which explicitly framed digitalization and decarbonization as mutually reinforcing dimensions of the transition toward climate-neutral transport systems. More recently, the European Commission adopted the EU Ports Strategy (2026), [17] which identifies five strategic priorities for European ports, including competitiveness, innovation, digitalization, energy transition, and resilience. Together, these policy developments have made increasingly clear that the successful implementation of the European Green Deal (2019)[18] depends not only on technological and infrastructural change, but also on new forms of collaboration, interoperability, and data governance among ports, logistics operators, energy providers, and public authorities.

While the empirical focus on the North Adriatic ports remains relevant, the case has consequently evolved from examining a regional governance arrangement to exploring the broader governance challenges associated with the green and digital transformation of the European maritime sector.

The primary governance challenge lies in the pervasive fragmentation of data exchange across maritime and logistics actors, alongside a critical deficit in European Union-level

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[12] European Commission, *White Paper: European Transport Policy for 2010: Time to Decide*, COM(2001) 370 final, Brussels, 12 September 2001, https://transport.ec.europa.eu/system/files/2016-09/lb_com_2001_0370_en.pdf

[13] Regulation (EU) 2024/1679 of the European Parliament and of the Council of 13 June 2024 on Union guidelines for the development of the trans-European transport network, amending Regulations (EU) 2021/1153 and (EU) No 913/2010 and repealing Regulation (EU) No 1315/2013, https://eur-lex.europa.eu/eli/reg/2024/1679/oj

[14] European Commission, *An Integrated Maritime Policy for the European Union*, COM(2007) 575 final, Brussels, 10 October 2007, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52007DC0575

[15] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257, 28 August 2014, pp. 135–145, https://eur-lex.europa.eu/eli/dir/2014/89/oj/eng

[16] European Commission, *Sustainable and Smart Mobility Strategy – Putting European Transport on Track for the Future*, COM(2020) 789 final, Brussels, 9 December 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0789

[17] European Commission, *EU Ports Strategy*, Brussels, 4 March 2026, https://transport.ec.europa.eu/transport-modes/maritime/eu-ports-and-industrial-maritime-strategies_en

[18] European Commission, *The European Green Deal*, COM(2019) 640 final, Brussels, 11 December 2019, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0640

guidance on efficient, cross-sectoral data sharing. This fragmentation is compounded by the dominance of proprietary software systems, which create competitive silos and restrict interoperability between diverse Port Community System environments. Furthermore, innovative digital solutions routinely fail to scale beyond localized, short-term pilot applications, leaving a systemic gap in cooperative structures across the broader European Maritime Space. At the same time, the rapid expansion of offshore wind energy and onshore power supply networks demands unprecedented real-time coordination between port authorities, renewable energy clusters, and electricity grid operators.

To address this multi-faceted governance deficit, this case study examines the development of a *Green Deal Aligned European Maritime Data Governance Framework*.

2.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 2

The governance strategy for Case 2 was developed through an iterative design-thinking process combining stakeholder interviews, participatory workshops, observations, and document analysis. The process sought to identify governance barriers to the green and digital transition of European ports and to co-develop governance arrangements capable of supporting interoperability, data sharing, and cross-border coordination within the European Maritime Space. The work involved representatives and members of the European Shippers' Council (ESC), Portbase (Netherlands), Valencia Port Foundation (Spain), and experts involved in the Portuguese JUL (Janela Única Logística). The strategy was informed by both interactive engagement and desk-based analysis of EU policy documents, port digitalization initiatives, and previous PERMAGOV findings.

Ideate: Defining the Preferred End-State

The ideation phase focused on understanding the governance challenges preventing ports from achieving Green Deal objectives related to efficiency, decarbonization, and digitalization. Stakeholder perspectives were collected through semi-structured interviews and a participatory workshop conducted during an ESC Councils meeting. An interactive Mentimeter exercise was used to identify barriers and opportunities associated with data sharing and digital governance.

Across all stakeholder groups, a common diagnosis emerged. While participants initially highlighted technical issues such as fragmented Port Community Systems (PCS), lack of interoperability, inconsistent data standards, and poor visibility across supply chains, discussions revealed that the underlying challenges were governance-related rather than technological. Stakeholders repeatedly identified lack of trust, uncertainty regarding data ownership, concerns over commercial confidentiality, weak incentives for information sharing, and limited cross-border coordination as the main obstacles to collaboration. Interviews confirmed that the technological capability to exchange data already exists, but that participation is constrained by institutional arrangements, commercial interests, and the absence of trusted governance structures.

The review of a concept note for the extension of the JUL concept to the Mediterranean Sea, currently being prepared by one of the actors who contributed to this investigation[19], further supported this diagnosis. The note demonstrates that achieving environmental objectives such as Just-in-Time arrivals, dynamic speed optimization, emissions monitoring, and

[19] Note called “MARBLUE-MED concept”. This is a confidential document as it is the basis for a potential research application.

predictive environmental compliance requires the integration of port systems, chartering systems, cargo-management systems, and vessel digital twins. This highlights the need for governance arrangements that extend beyond individual ports and encompass the wider maritime logistics ecosystem.

Based on these findings, the preferred end-state was defined as a trusted and interoperable European maritime data ecosystem in which ports, logistics operators, shippers, carriers, energy providers, and public authorities can securely exchange operational information, coordinate investments, improve just-in-time operations, and jointly contribute to the environmental and competitiveness objectives of the European Green Deal.

Prototype: Developing the Governance Strategy

The prototype phase translated this preferred end-state into a governance strategy. Rather than proposing a new centralized platform, stakeholders consistently argued that the key challenge was improving coordination among existing systems. Stakeholder's experience demonstrated that effective digitalization depends on harmonized processes, trusted governance arrangements, and interoperability standards rather than the creation of additional technologies.

The resulting prototype was conceptualized as a **Green Deal Aligned European Port Digital System**, understood primarily as a governance framework rather than a technological platform. The proposed strategy includes:

- a European interoperability layer enabling communication between existing PCS, Maritime Single Window environments, customs systems, and logistics platforms;
- a trusted data-governance framework specifying data ownership, access rights, liability, cybersecurity requirements, and data-sovereignty principles;
- a federated data-sharing architecture that allows actors to retain control over their data while participating in a wider ecosystem;
- a multi-stakeholder governance structure involving ports, shippers, carriers, digital service providers, energy actors, and public authorities;
- a common monitoring framework supporting Green Deal indicators related to emissions reduction, modal shift, just-in-time arrivals, and logistics efficiency;
- trust-building and value-creation mechanisms ensuring transparency, reciprocity, and demonstrable benefits for participating actors.

Particular inspiration was drawn from the Portuguese JUL experience,[20] which demonstrated the importance of harmonized processes, legislative support, multimodal integration, and long-term governance coordination, as well as from emerging federated data-space approaches.

Test: Validation and Risk Assessment

The testing phase assessed the feasibility and sustainability of the proposed governance strategy by comparing it against stakeholder concerns raised throughout the interviews and workshop discussions. Validation was primarily qualitative and focused on whether the strategy adequately addressed the barriers identified by different actor groups.

[20] https://www.projeto-jul.pt/ https://diariodarepublica.pt/dr/detalhe/decreto-lei/53-2019-122124254

The testing process confirmed that the principal implementation risks are institutional rather than technological. Stakeholders identified five recurring risks:

- lack of trust between actors;
- uncertainty regarding data ownership and data use;
- insufficient incentives for cooperation;
- fragmented governance frameworks and standards;
- unequal distribution of costs and benefits associated with data sharing.

An important finding was that environmental benefits such as emissions reduction, just-in-time arrivals, improved planning, and increased resilience are collective benefits, while the costs of integration, standardization, and data provision are often borne by individual organizations. This creates a governance gap that cannot be solved through technology alone. Stakeholders therefore emphasized the need for transparent rules, reciprocity in data exchange, pilot projects, financial incentives, and European-level coordination. Several interviewees also highlighted that interoperability requires two-way value creation; actors are significantly more willing to share data when they receive useful operational information in return.

Overall, the testing phase validated the proposed governance strategy. The process demonstrated that achieving the Green Deal's maritime objectives depends less on developing new digital technologies than on establishing governance mechanisms capable of generating trust, aligning incentives, clarifying responsibilities, and supporting collaborative decision-making across existing maritime digital infrastructures. The resulting strategy therefore focuses on interoperability, federated governance, transparency, and cross-sectoral cooperation as the foundations of a future European maritime data ecosystem.

2.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

2.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

The proposed governance strategy seeks to establish a **European Federated Maritime Data Governance Framework** that supports the green and digital transition of European maritime logistics. Rather than creating a new centralized platform, the strategy builds on existing Port Community Systems (PCS), Maritime Single Windows, logistics platforms, and shipping systems by improving the governance arrangements through which they exchange information. The proposed framework focuses on creating a trusted, neutral, and federated environment in which ports, shipping companies, logistics providers, shippers, energy providers, and public authorities can exchange operational and environmental information while retaining control over their own data. Its ultimate objective is to improve supply-chain efficiency, support decarbonization, enhance resilience, enable Just-in-Time operations, and facilitate compliance with emerging Green Deal requirements.

Key Recommendations

1. **Develop a European trusted maritime data governance framework** defining common principles for data ownership, access rights, authorization, cybersecurity, liability, and responsibilities for data sharing. Clear and trusted governance arrangements are a prerequisite for cross-border interoperability.

2. **Adopt a federated data-sharing model** that allows organizations to maintain ownership and control over their data while sharing selected information through agreed rules and interoperable interfaces. Stakeholders consistently preferred federated solutions over centralized platforms.
3. **Create a neutral European coordination mechanism** involving ports, shipping lines, shippers, logistics operators, public authorities, and PCS providers. Neutral governance is critical for building trust among actors with different commercial interests.
4. **Prioritize interoperability rather than system replacement.** European PCS operate under different governance and business models; therefore, the objective should be to connect existing systems rather than impose a single architecture.
5. **Develop pilot projects around shared challenges** such as Just-in-Time arrivals, emissions reporting, shore-power deployment, port congestion, and supply-chain resilience. Stakeholders emphasized that collaboration emerges when actors collectively address common problems.
6. **Link data sharing to clear value creation.** Organizations are more willing to share commercially valuable information when they receive tangible benefits such as improved visibility, operational efficiency, environmental reporting, compliance support, and better decision-making.
7. **Strengthen the role of trusted third-party orchestrators.** Experiences from stakeholders suggest that successful digital ecosystems depend on neutral actors capable of coordinating stakeholders, facilitating compliance, and supporting innovation across the maritime logistics ecosystem.
8. **Implement the framework incrementally through trust-building measures.** Starting with limited use cases and gradually expanding participation allows confidence, value creation, and governance arrangements to mature over time.

In summary, the strategy views maritime digitalization as primarily a **governance and change-management challenge rather than a technology challenge**. Achieving Green Deal objectives requires not only digital tools, but also trusted governance, neutral coordination, federated data sharing, and demonstrable value for participating actors.

2.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

The proposed governance strategy aligns closely with the Multi-Layered Collaborative Marine Governance (MLCMG) model, particularly through its focus on overcoming institutional barriers, strengthening collaborative dynamics, enhancing governance capabilities, and leveraging e-governance as an enabler of change. Rather than addressing a technological deficiency, the strategy responds to a governance challenge identified consistently across the stakeholder consultations: digital tools already exist, but actors lack the trust, incentives, institutional arrangements, and collaborative mechanisms needed to connect them or use them collectively.

The strongest connection is with the MLCMG component of Collaborative Dynamics. Interviews and workshops revealed that the main barriers to interoperability are not technical

standards but trust, commercial sensitivities, concerns over data ownership, and uncertainty regarding who benefits from data sharing. The governance strategy therefore seeks to strengthen the three collaborative dimensions identified in the MLCMG model: principled engagement, through transparent governance arrangements and shared decision-making; shared motivation, by ensuring that participants receive clear value from cooperation; and capacity for joint action, through common governance structures, interoperability standards, and coordinated implementation mechanisms. The emphasis on reciprocity and trust-building reflects the repeated stakeholder observation that data sharing only occurs when actors perceive mutual benefits and confidence in the governance framework.

The strategy also directly addresses the MLCMG component of Institutional Attributes. Stakeholders highlighted fragmented governance arrangements, divergent standards, unclear responsibilities, and weak coordination across jurisdictions as key obstacles to digital and environmental innovation. These are precisely the types of institutional barriers that the MLCMG model identifies as constraining adaptation and governance performance. The proposed federated governance framework seeks to reduce these barriers through common data-governance principles, interoperability arrangements, and coordination mechanisms that allow diverse actors and systems to collaborate without requiring organizational or technological uniformity.

The governance strategy also strongly reflects the E-Governance component of the MLCMG model. The proposed interoperability framework is intended to improve what the model describes as seeing and knowing, by enabling actors to access more accurate and timely information on vessel arrivals, emissions, cargo movements, and port operations. At the same time, it supports participation and engagement by allowing a wider range of actors to contribute to and benefit from shared information systems. Finally, it facilitates more effective interventions and actions, particularly through use cases such as Just-in-Time arrivals, emissions monitoring, supply-chain visibility, and operational optimization. However, reflecting stakeholder concerns, the strategy treats digitalization as a governance instrument rather than a solution in itself, acknowledging that technology cannot overcome trust deficits or institutional fragmentation on its own.

Finally, the strategy contributes to several Governance Capabilities identified in the MLCMG model. It promotes rescaling by addressing governance challenges that span ports, countries, and sectors; responsiveness by enabling faster and more informed decision-making; reflexivity by creating feedback mechanisms and performance monitoring systems; and revitalization by introducing new forms of cooperation capable of overcoming long-standing interoperability challenges. The proposed use of pilot projects and incremental implementation also reflects the capability to adapt and learn over time.

Overall, the governance strategy represents primarily a form of governance and institutional innovation. In MLCMG terms, it seeks to improve governance performance by transforming fragmented and siloed digital arrangements into a collaborative and trusted maritime data ecosystem, thereby enhancing the capacity of maritime actors to contribute collectively to the objectives of the European Green Deal.

2.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

The strategy is primarily positioned within the *Creation of Alternative Solutions* category. Stakeholder consultations consistently demonstrated that the main challenge is not the lack of digital technologies, but the absence of trusted governance arrangements capable of connecting existing Port Community Systems, logistics platforms, maritime authorities, and supply-chain actors. The strategy therefore proposes a new governance model based on federated data sharing, interoperability frameworks, trusted data governance, neutral coordination mechanisms, and reciprocal value creation. Rather than prescribing a specific technological solution or regulatory intervention, it seeks to address persistent governance challenges related to trust, data ownership, collaboration, and interoperability across the European maritime logistics ecosystem.

The strategy also contains important policy-making components. Several recommendations target existing European and national governance processes, including the development of common interoperability standards, harmonised data governance rules, institutional coordination mechanisms, and support for Green Deal implementation. Stakeholders repeatedly emphasized that voluntary cooperation alone is unlikely to overcome fragmentation, and that stronger European coordination is needed to establish common rules while preserving local autonomy and competition. Consequently, the strategy provides actionable recommendations that could inform future policy development and implementation in the maritime and logistics sectors.

In addition, elements of enhanced experimentation are present. Interviews highlighted that trust, reciprocity, and collaborative behaviour cannot be designed solely through policy or technology but must be developed incrementally through practice. Stakeholders therefore advocated pilot projects, demonstration initiatives, and phased implementation as mechanisms for testing governance arrangements before wider deployment. Examples include initiatives focused on Just-in-Time arrivals, emissions monitoring, operational visibility, and cross-border data exchange. These experimental activities help demonstrate value creation, reduce uncertainty, and build confidence among participating actors.

Overall, the governance strategy is best characterised as a hybrid strategy dominated by the Creation of Alternative Solutions approach, while incorporating supporting elements of Policy-Making and Enhance Experimentation. This reflects the fact that the case has moved beyond simply understanding the governance challenge and instead proposes a novel governance framework capable of addressing interoperability, trust, and coordination challenges in support of the European Green Deal.

Approximate positioning within the PERMAGOV strategy types:

- 70% Creation of Alternative Solutions
- 20% Policy-Making
- 10% Enhance Experimentation

The strategy has only a limited focus on Understanding Transition Potential, since the stakeholder process moved beyond problem framing toward the design and validation of concrete governance interventions.

2.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

Sustainability Risks

From an SDG perspective, the strategy primarily contributes to **SDG 9 (Industry, Innovation and Infrastructure)**, **SDG 13 (Climate Action)**, and **SDG 17 (Partnerships for the Goals)**. However, several sustainability risks were identified.

A key risk is **insufficient stakeholder participation**. If only a limited number of ports, logistics providers, or shipping companies participate, the expected benefits from interoperability, Just-in-Time arrivals, emissions reduction, and supply-chain visibility may not materialize at system level.

Another risk concerns the **unequal distribution of costs and benefits**. Environmental and societal benefits such as reduced emissions, lower congestion, and improved logistics performance are largely collective, while investments in system integration, data provision, cybersecurity, and organizational adaptation are often borne by individual actors. This may discourage participation, particularly among smaller organizations.

There is also a risk that **digitalization reinforces existing inequalities** if larger actors possess greater resources and data-sharing capacities than smaller ports and logistics providers. This could undermine inclusiveness and reduce the overall effectiveness of the governance framework.

Political Risks

The strategy requires collaboration across multiple countries, governance levels, and economic sectors. **Political fragmentation** therefore represents a significant implementation risk. Stakeholders highlighted the possibility of divergent national priorities, competing governance models, and reluctance to adopt common European standards. Actors may also resist governance arrangements perceived as reducing local autonomy or increasing external oversight.

A further political risk concerns data governance. Differences in views regarding data ownership, commercial confidentiality, market competition, and responsibilities for governance may hinder agreement on common rules and standards. Several interviewees noted that trust remains fragile and that organizations may be reluctant to share commercially sensitive information unless governance arrangements are viewed as neutral and transparent.

Resource-Related Risks

The implementation of interoperable and federated governance arrangements requires sustained investments in digital infrastructure, cybersecurity, data standardization, system integration, and coordination mechanisms. Resource constraints may therefore limit participation, particularly among smaller actors with limited technical or financial capacity.

A related risk concerns the availability of organizational capabilities. Successful implementation depends not only on technology but also on the skills, knowledge, and governance capabilities needed to manage data, participate in collaborative processes, and implement new governance arrangements. Stakeholders emphasized that capability gaps may slow adoption and reduce the effectiveness of the proposed framework.

To mitigate these risks, stakeholders emphasized the importance of phased implementation, pilot projects, financial incentives, transparent governance arrangements, common standards,

and federated data-sharing models that preserve organizational autonomy while demonstrating clear value for participants. Building trust and creating reciprocal benefits were identified as the most important conditions for long-term sustainability and implementation success.

2.4. UPSCALING

A central finding of the case is that Europe already possesses successful examples of digital maritime governance. In particular, the Portuguese **Janela Única Logística (JUL)** demonstrates how interoperability can be achieved by connecting ports, customs, logistics operators, rail, road, and public authorities through a shared governance framework rather than through technological centralization. The experience of JUL shows that digital transformation depends on harmonized processes, trusted governance, clear responsibilities, and long-term institutional coordination.

The principal upscaling message is therefore that the next step for European maritime governance is not to create another platform, but to scale the governance logic of JUL to the European level. This would involve developing a federated European framework that connects existing Port Community Systems, Maritime Single Windows, logistics platforms, and emerging maritime data spaces through common governance principles, interoperability standards, and trusted coordination mechanisms.

For EU policymakers, four recommendations emerge:

- Move from technical interoperability towards governance interoperability, with common rules for data ownership, access rights, responsibilities, and trust-building.
- Support a federated European maritime data ecosystem, building on existing national and port-level systems rather than replacing them.
- Promote cross-sector integration, linking ports, logistics, shipping, energy systems, and public authorities within a common governance framework.
- Use successful national experiences, particularly JUL, as reference models for EU-wide implementation and scaling.
- Support incremental participation through targeted incentives and financial assistance, particularly for smaller and medium-sized ports.

These findings are directly relevant to several priorities of the European Ocean Pact.[21] Improved interoperability and data sharing contribute to Protecting and Restoring Ocean Health through reduced emissions and more efficient vessel operations. A federated maritime data ecosystem supports Boosting the Competitiveness of the EU Sustainable Blue Economy by improving efficiency, resilience, and innovation. The emphasis on digital integration and shared information infrastructures contributes to Advancing Ocean Research, Knowledge, Skills and Innovation, while common governance standards and cross-border coordination mechanisms support Strengthening EU Ocean Diplomacy and International Ocean Governance.

[21] European Commission, *The European Ocean Pact*, COM(2025) 281 final, Brussels, 5 June 2025, https://oceans-and-fisheries.ec.europa.eu/european-ocean-pact_en

Overall, the case demonstrates a progression from a regional port-cooperation initiative (NAPA) to a broader understanding of governance requirements for the European Maritime Space. The key lesson is that Europe should focus on scaling successful governance arrangements such as JUL into a federated European maritime governance framework capable of supporting the digital and green transition envisioned by the European Green Deal, the EU Ports Strategy, and the Ocean Pact.

2.5. REFLECTIONS ON THE METHODOLOGY

The PERMAGOV backcasting methodology proved useful for this case because it provided a structured process while remaining sufficiently flexible to accommodate an evolving governance challenge. The case began with a focus on the governance of Motorways of the Sea and the North Adriatic Ports Association (NAPA), but stakeholder engagement gradually revealed that the core challenge was broader and concerned the governance of digitalization, interoperability, and data sharing across the European maritime system. The non-prescriptive process guidance allowed the case to adapt to these insights without having to redesign the overall methodology.

The stepwise process outlined in the handbook was relatively easy to follow. The sequence from identifying governance challenges, defining a preferred end-state, developing actions, and ultimately formulating a governance strategy created a logical progression. In particular, the focus on a preferred end-state helped move discussions beyond current barriers and encouraged stakeholders to consider what a well-functioning European maritime governance arrangement would look like.

The most difficult part of the process was the selection of actions. Unlike some PERMAGOV cases where specific governance interventions could be identified relatively easily, stakeholders in this case repeatedly emphasized that the problem was systemic rather than operational. As a result, the discussions generated many potential actions related to standards, governance arrangements, trust-building, incentives, interoperability, digital infrastructure, and stakeholder coordination. Distinguishing between actions, enabling conditions, and long-term governance objectives was not always straightforward. The process therefore evolved from identifying individual actions towards identifying a coherent governance framework capable of supporting multiple actions and future initiatives.

The validation of the governance strategy was comparatively easier. A notable finding was the consistency of views across different stakeholder groups. Representatives from ESC, Portbase, Valencia Port Foundation, and the Portuguese JUL initiative all highlighted similar governance challenges, namely fragmented governance arrangements, lack of trust, unclear data ownership, weak incentives for information sharing, and limited interoperability. This convergence increased confidence that the strategy addressed genuine governance barriers rather than organization-specific concerns.

The methodology was particularly valuable in encouraging interaction between stakeholder knowledge and policy analysis. The interviews and workshop discussions helped challenge the initial assumption that interoperability is primarily a technological issue and instead revealed its governance dimensions. This ultimately led to a governance strategy focused on federated governance, trusted data sharing, and interoperability rather than on new technological solutions.

Overall, the flexible design of the PERMAGOV backcasting approach was one of its main strengths. It allowed the case to move from a regional governance study focused on NAPA to a broader governance strategy aimed at supporting the digital and green transition of the European maritime sector, while maintaining strong links to stakeholder experiences and practical policy challenges.

3. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 3: BALTIC SEA SEABED MANAGEMENT

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3.1. SHORT CASE DESCRIPTION

This case investigates the governance practices, change, and related challenges to implementing regional sea and EU commitments to protect benthic habitats from loss and disturbance to preserve seabed integrity in the Baltic Sea. Within the EU, the protection of benthic habitats is stipulated especially in the Marine Strategy Framework Directive (MSFD) and its Descriptor 6 'Sea-floor integrity'.

A special focus in the case is HELCOM's progress in defining and implementing "a common approach to address and where possible minimize the loss of and disturbance to seabed habitats caused by human activities"[22], through which HELCOM is seeking a coordinated governance response to strengthen the protection of benthic habitats.

The starting point for developing a governance strategy was based on the earlier PERMAGOV analysis of the governance challenges that need to be addressed. The overall governance need is *to improve coordination and coherent implementation of seabed management activities in the Baltic Sea region in order to reach good environmental status*. This overall need was further split into four more detailed needs for operationalisation:

*The HELCOM Common Approach (CA) needs to be **cross-sectoral** to deal with cumulative impacts of different sectors on the seabed and to coordinate between existing and anticipated sectoral management approaches (sectoral perspective). The common approach needs to support **coordination of the HELCOM Contracting Parties' joint activities** in seabed protection in general (regional sea perspective). The third aspect relates to practical **coordination of seabed-related actions within HELCOM** (HELCOM perspective). Finally, the CA needs to be **compatible with national approaches**, a precondition of acceptance of the common approach and its eventual implementation (national perspective)*.

3.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 3

The main methods in the *ideation phase* (reported in D6.1[23]) consisted of a desk study, observations in HELCOM meetings, and collection of feedback in HELCOM meetings.

The desk study summarised elements in the D4.2 related to HELCOM's Common Approach (CA) to seabed management. We also re-analysed interviews that were originally collected for D4.2, because that deliverable did not analyse governance challenges from exactly the same perspective as D6.1 did. The interview data consists of 20 semi-structured interviews conducted between May 2024 and January 2025. The interviewees were from different levels of governance: the EU, HELCOM, national, and sub-national. The selected persons from the Baltic Sea region were from Poland, Sweden, Estonia, Denmark, Germany, and Finland. They were mainly working in national level environmental or fisheries administration. Most of them also have one or more roles in HELCOM and/or European Commission (EC) working or expert

[22] Baltic Sea Action Plan Action S65. https://helcom.fi/wp-content/uploads/2021/10/Baltic-Sea-Action-Plan-2021-update.pdf

[23] Falk-Andersson, J., Christina Kelly, Nelson F. Coelho, Moses Adjei, Riku Varjopuro, Luke Dodd, Päivi Haapasaari, Sun Cole Seeberg Dyremose, Gitte Davidsen, Daniele Pagani, Jane Kruse, Shannon McLaughlin, Antoine Lafitte, Lindsey West, Kåre Nielsen, Neil Farrington, Judith van Leeuwen, Ben Boteler, Cristian Passarello, Helder Pereira, Andreas Kortenhaus, Matteo Alexander Nenciolini, Giulia Prato, Andrea Zanella, Troels Jacob Hegland (2025, unpublished). "Deliverable 6.1 Co-production of joint problem statements and actionable insights". PERMAGOV project.

groups relevant to sea-floor integrity. We also interviewed two EC officers whose work relates to either MSFD or fisheries, and three persons from international NGOs representing fishing or dredging industries, or environmental organizations. We also conducted a follow-up interview with a high-level HELCOM Secretariat officer.

Observation material was collected during HELCOM informal consultation sessions known to touch on the CA from late-2024 through 2025 including informal consultation sessions of WG GEAR, WG Sea-based Pressures, WG BioDiv, EG MPA, EG Benthic, and two ad-hoc sessions specific to development of the CA.

In May 2025 PERMAGOV had a dedicated session as part of a meeting of HELCOM's WG GEAR. During that session we validated our initial governance challenge with the participants. This was done via a survey implemented using the Mentimeter online interaction tool. The initial governance challenges were presented as assertions, which the respondents rated on a sliding scale from strongly disagree to strongly agree (see below).

The *prototyping phase* was conducted as a desk study. Based on the analysis, observations, and feedback during the *ideation phase,* we compiled a draft governance strategy that brought together key ideas for solutions to enhance Baltic Sea level collaboration in managing the seabed. We could not do the prototyping phase extensively in collaboration with stakeholders, because the organization of stakeholder engagement in this case was totally dependent on the schedules and ways of working of HELCOM's working groups and experts. The groups have meetings twice a year and usually it is not possible to get them to meet between the meetings. We organized an online workshop to discuss the draft governance strategy. The timeslots granted for PERMAGOV to present or to organize collaborative sessions during the groups' regular meetings were very short. This also limited the possibilities for proper co-creation.

Testing was again a combination of desk study and stakeholder feedback. For collecting views from the HELCOM community, we organized a workshop in March 2026 to scrutinize the draft governance strategy. The workshop was participated by only a limited number of participants, but we got representatives of the key working and expert groups that work with seabed related matters. Based on the feedback, the governance strategy was updated and later presented to the working group on Sea-Based Pressures for further *testing*, but that meeting did not provide substantial feedback. After that, the draft was finalized and submitted to the meeting of HELCOM's Heads of Delegation (HOD) for final approval. The HOD meeting did not adopt the governance strategy as a formal HELCOM document, but accepted it as an internal reference document, to be used by relevant HELCOM groups as supporting guidance for planning and implementing relevant actions.

3.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

3.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

The Common Approach (CA) recognizes that seabed habitats are fundamental to Baltic Sea biodiversity and ecosystem functioning. Human activities such as fishing, dredging, infrastructure development, shipping, aquaculture, and eutrophication can cause both direct physical damage and indirect ecological degradation. Because these pressures interact and

accumulate, the document advocates an ecosystem-based management (EBM) approach rather than relying solely on sector-specific regulation.

The CA proposes a comprehensive governance framework rather than introducing strict new regulatory measures. Its central message is that seabed protection requires integrated spatial planning, stronger coordination across sectors, improved scientific knowledge, better data sharing, and clear institutional responsibility. The strongest justifications throughout the document are the need to address cumulative impacts, fill knowledge gaps about seabed resilience, and support implementation of EU and HELCOM obligations through a practical ecosystem-based management approach.

The CA was submitted to the informal consultation of HELCOM's Heads of Delegations (HOD) in June 2026. HOD's informal consultation recommended the document as an internal living document, to be used by relevant Working Groups as supporting guidance for planning and implementing relevant BSAP actions.

Main recommended actions

1. *Strengthen spatial protection and Marine Spatial Planning*

There is a need for comprehensive approaches, because traditional sector-by-sector management alone is insufficient to address cumulative impacts and the Marine Strategy Framework Directive (MSFD) Descriptor 6 requirements concerning sea-floor integrity. Spatial planning is a practical mechanism for coordinating multiple sectors, managing impacts on the ecosystem scale, and balancing environmental protection with sustainable use of marine resources. Marine protected areas (MPAs) are effective for protecting high-value habitats, while MSP and Other Effective (area-based) Conservation Measures (OECMs) provide more flexible solutions in areas with ongoing economic activity.

Recommended actions:

- Expand and improve spatial protection measures such as MPAs and OECMs in terms of seabed protection.
- Apply spatial planning more broadly to steer human activities away from environmentally sensitive seabed areas.

2. *Address diffuse pressures, especially eutrophication*

Eutrophication is one of the most important large-scale pressures on seabed habitats. Nutrient enrichment reduces water clarity, limits light penetration, contributes to oxygen depletion, and ultimately causes loss of benthic habitats. Nutrient reduction measures may be among the most impactful long-term actions available for seabed conservation.

Recommended actions:

- Continue reducing nutrient inputs.
- Address eutrophication, marine litter, and hazardous substances as part of seabed protection efforts.
- Maintain implementation of nutrient input ceilings and related measures.

3. *Use active restoration selectively*

Restoration is important but limited in scope because it is costly and resource-intensive. Restoration efforts will only succeed when underlying pressures are properly managed. Therefore, restoration should complement, not replace, measures that prevent seabed habitat loss and disturbance.

Recommended actions:

- Implement restoration of benthic habitats where appropriate.
- Follow the HELCOM Regional Action Plan for Benthic Habitat Restoration.
- Ensure that pressures causing degradation are first reduced or eliminated.

4. *Develop and maintain sector-specific guidance*

Many human activities affect seabed habitats. The Common Approach therefore recommends utilizing HELCOM guidance documents to ensure that seabed impacts are systematically considered within each sector.

Recommended actions:

- Develop, review, and regularly update HELCOM Guidelines, Best Environmental Practices (BEPs), and Best Available Technologies (BATs) for activities affecting the seabed.
- Prioritize guidance for fisheries, offshore infrastructure, shipping, sea-floor mining, carbon capture and storage, recreational boating, tourism, aquaculture, and dredging.

5. *Establish a Common Regional Research Infrastructure (CRRI)*

A major obstacle to better seabed management is lack of knowledge regarding habitat sensitivity, resilience, and recovery from disturbance. There is a need to coordinate collection and analysis of scientific evidence. The Contracting Parties can accelerate research in this area at a very low cost by establishing scientific reserves compatible with this field of research.

Recommended actions

- Create a network of protected research sites across the Baltic Sea.
- Designate a managing authority.
- Develop common procedures for scientific access and experimentation.
- Use existing MPAs, Natura 2000 sites, or OECMs where possible.

6. *Improve monitoring, data availability, and data sharing*

Effective management depends on reliable and comparable data. Direct seabed monitoring is expensive and resource-intensive, making improved data integration and technological innovation critical. Better data sharing supports national implementation of the MSFD, HELCOM assessments, and adaptive management.

Recommended actions

- Ensure timely sharing of seabed-related data with HELCOM.
- Standardize data formats, metadata, and quality assurance procedures.
- Automate data flows where possible.

- Adopt new technologies including modelling, remote sensing, robotics, and artificial intelligence.

7. *Develop a common understanding with national security authorities*

Many environmental datasets have potential military significance. Consequently, security concerns increasingly constrain access to environmental information, especially its public presentation and sharing. Proactive dialogue between relevant branches of administration is necessary to balance national security interests with environmental monitoring needs and to ensure continuity of long-term datasets.

Recommended actions

- Initiate structured discussions with military and security actors.
- Develop regional agreements regarding environmentally relevant data, including data security, availability, and resolution.
- Establish long-term cooperation mechanisms between environmental and security communities.

8. *Clarify governance and collaboration practices within HELCOM*

HELCOM does not have a dedicated seabed working group. Establishing a new group is, however, not feasible. And a new group would not necessarily help to solve the problem of poor coordination between groups. To avoid fragmented implementation, the Common Approach proposes clearly defined responsibilities, inter-group cooperation mechanisms, and workplan commitments that collectively provide the focus and accountability of a dedicated working group without creating one.

Recommended actions

- Assign clear leadership roles among HELCOM groups
- Integrate seabed integrity responsibilities into HELCOM workplans.

9. *The most significant near-term actions*

The CA presents also an action plan from which the first actions to be taken are:

- Review and update existing guidance on dredging, aquaculture, tourism, and coastal infrastructure.
- Update relevant HELCOM group workplans to include seabed integrity responsibilities.
- Begin discussions with national security actors concerning environmental data sharing.

3.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL (1 PAGE)

In terms of the MLCMG model the governance strategy relates especially to *collaboration dynamics* and *institutional attributes*. It has also some elements of *e-governance* but even then, mainly related to institutional attributes that may support or hinder the use and adoption of digital solutions.

The governance strategy proposes new ways of organizing and practicing collaboration and coordination between several working and expert groups that address seabed management

in their work. Enhancing c*ollaboration dynamics* is the key to achieving the objective of agreeing and implementing a common approach. Another collaborative element in the strategy is to improve collaboration related to data availability and sharing, and the coordination of scientific studies.

The governance strategy aims for greater coherence in seabed management practices of the Baltic Sea countries. In terms of *institutional* attributes, the strategy addresses thus the scales of institutions. The strategy is also building on existing guidance and processes. In other words, using the existing institutional setting. One of the biggest, current institutional challenges that the strategy addresses is to enhance dialogue with security authorities.

Knowledge-related barriers in seabed management are also addressed by suggesting improved sharing of data and a new regional research infrastructure. The action to improve dialogue with security authorities is particularly focused on seabed data.

3.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES (1 PAGE)

Regarding the governance strategy types, the HELCOM Common Approach to seabed management is mainly *a policy-making document*. It proposes a governance pathway for HELCOM, while HELCOM itself is an established governance arrangement. Many of the actions proposed in the CA are based on what already exists, such as the recommendation to update existing guidance documents, or what is already being done, such as combatting eutrophication, improving nature conservation via MPAs, OECM and restoration, and HELCOMs' work on MSP.

The CA includes elements of *the creation of alternative solutions*, as well. The actions that relate to already existing documents and practices propose new elements to them and new thinking about how HELCOM has so far worked on seabed management. The CA also has some new initiatives. One is the establishment of a new Regional Research Infrastructure to (structurally) strengthen and coordinate seabed-related research in the Baltic Sea region. The action to re-think and re-organise collaboration and coordination between various HELCOM groups is also based on new ways of understanding how HELCOM could work on topics that cross across multiple working and expert groups. Finally, the action for establishing dialogue with security authorities belongs to the novel proposals.

3.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

Risks regarding implementation of some of the actions in the governance strategy were discussed in the online workshop that we organized in spring 2026. The proposed Common Regional Research Infrastructure (CRRI) was seen as particularly vulnerable during discussions. The proposal for CRRI was well accepted by the workshop, but it was reminded that currently most of the governments around the Baltic Sea are cutting state budgets and spending. A proposal for a new research infrastructure – even if not requiring substantial additional funding – may be difficult to get accepted. That action is thus desirable, but not necessarily viable, if it lacks resources or political support.

Another topic that was found possibly difficult to implement was to establish a dialogue with security authorities regarding sharing and publishing seabed data at the regional sea level. Such dialogue has never been tried, which is why its feasibility was difficult to assess.

The final draft of the Common Approach to seabed management was discussed at the meeting of Heads of Delegations in 2026. The meeting accepted the governance strategy, but only as an internal reference document, to be used by relevant HELCOM groups as a supporting guidance for planning and implementing relevant actions. As an internal document, its steering effect is not very strong. It was also noted that there are several on-going EU processes that will affect seabed management in the Baltic Sea region. HELCOM needs to follow the outcomes of these processes and see how HELCOM level seabed management activities can fit with them. The changing policy landscape is thus a factor that influences viability of this governance strategy, but for now it is uncertain which of the developments may support or hinder the implementation of CA.

Due to limited possibilities to collaborate and co-create with HELCOM groups, we did not conduct a collaborative assessment of sustainability of the proposed actions. The actions aim to improve environmental sustainability by promoting improved seabed management. Since the governance strategy addresses intergovernmental collaboration and practices around seabed management, it does not have direct economic impacts on businesses, or social impacts on communities, except in a speculative manner. Such impacts will be generated by national and local level decisions on economic activities that affect the seabed. Improving the state of benthic habitats may also have positive consequences for businesses and communities through the provision of various ecosystem services. Assessment of national and local level impacts is beyond the scope of this study.

3.4. UPSCALING

One *rescalable* message from this governance strategy is that effective seabed management requires collaboration between a range of actors, because so many human activities cumulatively affect benthic habitats. Furthermore, the types of actions proposed in the governance strategy cover topics broadly from spatial planning to sector-specific guidance, data sharing practices, and scientific collaboration. Even security aspects are covered. The governance strategy focuses on regional sea level activities. That would benefit from and is to some extent dependent on the application of similar actions at national level across the Baltic Sea region.

A *replicable* message is that other regional seas can take up some ideas of the Baltic Sea's common approach to seabed management.

3.5. REFLECTIONS ON THE METHODOLOGY

The main methodological challenge in this case was related to limited access to stakeholders for co-creating the governance strategy. The case is conducted at the level of HELCOM (an intergovernmental organisation) and is to a large extent dependent on the organisation's working practices and schedules. This was not a big challenge in the earlier PERMAGOV work that was more based on interviews. In the phases of ideation, prototyping and testing to develop the governance strategy, organising interactive events was limited to a couple of

sessions, which did not allow continuous and consistent co-creation. We had interactive sessions in the ideation and testing phases, but prototyping was based on a desk study.

4. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 4: CO-MANAGEMENT OF THE TORRE GUACETO MPA

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4.1. SHORT CASE DESCRIPTION

A key aspect of the European Green Deal objective to conserve biodiversity and restore ecosystems is the improvement of Marine Protected Area (MPA) governance. Marine protected areas (MPAs) are spatial management tools widely used to conserve and manage coastal resources, serving as spaces dedicated to the long-term conservation of nature and associated ecosystem services and cultural values (Mast et al., 2025[24]). The EU Biodiversity Strategy contains specific commitments and actions on MPAs, including protecting a minimum of 30% of EU's Sea area by 2030, with 1/3 of the 30% being strictly protected. Following these objectives, the Italian government has in its first objective of their National Strategy for Biodiversity to create, by 2030, a network of terrestrial and marine protected areas to cover 30%, including the 10% strictly protected areas. Italy currently has about 30 MPAs and 2 submerged National Parks and several Natura 2000 sites. However, the area of the actual protected sea is far from the 2030 objectives. Currently, the protected sea areas cover only 13% of Italian territorial waters[25].

High fragmentation, lack of implementation of management plans, lack of resources and inadequate systems of surveillance in general severely hamper the achievement of adequate conservation status for areas under protection leading to what is known as 'paper parks' (Guidetti et al., 2008[26], and 2014[27]; Di Franco et al., 2016[28]). This has in part led to a perception of MPAs as inefficient conservation tools, challenging further the creation of new protected areas, including Natura 2000 sites, in Italy.

This case study focuses on the marine protected area of Torre Guaceto in Southern Italy, where the MPA utilizes co-management with local community structures by sharing responsibilities, including with local fishers and voluntary guards. Being valuable players in the socio-ecological system, they are able to combat pressures such as illegal fishing and unauthorized activities inside the protected area. This approach increases adaptive management capacity. At the same time, it faces challenges regarding enforcement, stakeholder participation and access to information. Thus, the main Point of View (POV)[29] relates to the need for effective monitoring and surveillance system and better sharing of data between actors involved in the MPA management.

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[24] Mast, A., Gill, D., Ahmadia, G. N., Darling, E. S., Andradi-Brown, D. A., Geldman, J., ... & MacNeil, M. A. (2025). Shared governance increases marine protected area effectiveness. *PLoS One*, *20*(1), e0315896.

[25] https://indicatoriambientali.isprambiente.it/en/protected-areas/natura-2000-network

[26] Guidetti, P., Milazzo, M., Bussotti, S., Molinari, A., Murenu, M., Pais, A., ... & Tunesi, L. (2008). Italian marine reserve effectiveness: does enforcement matter?. Biological Conservation, 141(3), 699-709.

[27] Guidetti, P., Baiata, P., Ballesteros, E., Di Franco, A., Hereu, B., Macpherson, E., ... & Sala, E. (2014). Large-scale assessment of Mediterranean marine protected areas effects on fish assemblages. PLoS One, 9(4), e91841.

[28] Di Franco, A., Thiriet, P., Di Carlo, G., Dimitriadis, C., Francour, P., Gutiérrez, N. L., ... & Guidetti, P. (2016). Five key attributes can increase marine protected areas performance for small-scale fisheries management. Scientific reports, 6(1), 38135.

[29] The essential needs of the MPA and users as highlighted through Point of Views, which gives insight of why the MPA, and its users have these needs. Thus, a POV is an actionable problem statement which serves as the starting point in ideation.

4.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 4

The research design for the case study involved two-phased processes: Phase 1 involved the governance problem analysis and selection of tool/intervention. Phase 2 was the research and innovation stage where we set an innovation process in motion for the actual tool calibration, testing/implementation and where re-adaptation was done.

Phase 1: Problem analysis and selection of tool

The project meeting in February 2024 in Brussels as a starting point where we engaged with our Italian project partner WWF Italy. During the project meeting, a list of relevant stakeholders to be interviewed were compiled in consultation with the project partner and preliminary discussions of the main challenges of Italian MPAs, the key regulations were shared by the project partner.

After the project workshop, more detailed literature and document analyses were conducted, followed by semi-structured interviews (both in person during our scoping visit to the MPA area, and online using Teams). These qualitative methods benefited the case study analysis as they provided context and understanding of complex issues in the MPA governance process particularly related to the actors, rules, resources/power dynamics, institutional barriers and collaboration dynamics. The literature review offered a critical evaluation of relevant scholarly works on MPAs (both in Italy and globally), co-management practices, digitalisation and marine governance. The document analysis focused on relevant documentation and reports (e.g. policy briefs, press releases, directives, government documents and relevant websites), relating to Italy and particularly the Torre Guaceto MPA to get a better understanding of the study context. These methods together provided the baseline diagnosis of the MPA governance problem. After interactive session with the project partner WWF who have worked in the MPA and Italian context for years and served as a key member of the management consortium in Torre Guaceto MPA, it was clear that SMART could be the tool capable of addressing the needs of the MPA towards its effectiveness. The platform (smartconservationtools.org) enables users to collect, visualize, analyze, and report information, thereby facilitating interaction among different actors under continuously adaptive situations.

The objective of the governance strategy is to enhance the implementation of the Torre Guaceto protected area management through improved data sharing and stakeholder participation (first step), thus paving the way for more active and targeted enforcement by the coastal guard (second step). The specific preferred end state is as below:

- ‘Achieving a Marine Protected Area (MPA–SAC-Park) that is managed effectively and with a participatory approach, capable of protecting Posidonia and coralligenous habitats, and fish stocks, while ensuring environmentally and socio-economically sustainable small-scale fishing'.

Phase 2: The innovation Process (Calibrating, testing and evaluating and re-adapting)

Upon selection of the SMART tool, the next phase of the case study involved calibration of the tool to fit the local context, tool testing, evaluation, and re-adaption. Under this phase, roles were divided between the academic research team and the innovation team. The main

activities/tasks included: Interactive workshops to introduce the tool to stakeholders (fishers, tourism operators, etc.), and to further explore the specific governance challenges that the tool seeks to address; tool piloting in the MPA area with selected actors; survey and interviews to evaluate the tool and the innovation process. These specific actions, which forms the second phase of the innovation process sought to advance the overarching system of digital interaction by exploring the potential of a SMART conservation technological tool as an e-governance intervention. A major aspect of the innovation process was undertaken by the SMART tool expert and WWF as described in the next section.

4.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

4.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

This case study proposes SMART (smartconservationtools.org) as an e-governance intervention that streamlines how field information reaches decision-makers. This innovation provides free software designed to help manage and protect wildlife and wild spaces. Officially launched in 2015, the platform is now used in more than 30 countries and is continuously maintained by eight active partners, including the WWF, which is an active member of the Torre Guaceto administrative board and partner in the PERMAGOV project.

SMART Tool is a technological data management platform that integrates mobile, desktop, and cloud-based services. In the field, practitioners can use an App called smart mobile on their smartphones to record data about what they encounter, and track where their patrols go. Information on animals, illegal activities, and conservation actions taken are recorded and then fed into a central database, called smart desktop. The online option server called smart connect allows the transmission of data. Different levels of users between administrators and personnel can be defined even with roles and divided by teams. Data can then be quickly analysed, visualized, mapped and acted upon so that users can rapidly respond to threats. Standardized reports can also be configured and run with just a few clicks, ensuring that key information can be delivered to decision-makers in a timely fashion.

SMART is an adaptive, open-source technology that functions in both online and offline environments, making it easy to maintain and sustain at the site level. It serves as an effective e-governance solution by bridging the gap between passive policy design and active field enforcement. It also promotes integration with other tools and platforms. It has been used to evaluate the presence of key ecological species in Croatia, Spain, and Portugal. In Sweden, municipal protected areas utilize the technology to improve local conservation efforts, specifically providing advanced data collection toolsets and comprehensive training for conservation officers to better manage protected natural areas. Meanwhile, in several Latin American and South Asian countries, it has been embraced as the official national information system for protected area networks.

In Italy, the platform has been in use since 2025 with the support of WWF Italy–Mare. In the Portofino MPA within the Ligurian Sea, it was initially deployed to strengthen the ghost-gear monitoring program following the Reef Check network alert protocol. For this case study, the

Torre Guaceto MPA management agreed to adopt the smart tool and has begun planning its implementation to facilitate enforcement data collection by voluntary ecological guards (Guardie Ecologiche Volontarie, or GEV) across the Natura 2000 site, which is formally designated as the 'Torre Guaceto e Macchia S. Giovanni' Special Area of Conservation. This expands the scope of the case study from the marine protected area into terrestrial spaces by incorporating its sister protected area, the State Natural Reserve (SNR). Consequently, both the MPA and the SNR will reinforce the execution of their respective management plans, specifically targeting surveillance and monitoring activities.

Stakeholder Workshop

On January 19-20, 2026, the case study team (led by WWF Italy) organized a stakeholder meeting involving professional small-scale fishers, tourism operators active within and around the Torre Guaceto Marine Protected Area (MPA), long with three staff members from the Torre Guaceto MPA, including its director. An interactive exercise was conducted to collect information on key issues perceived by stakeholders, their underlying causes, and possible solutions in the 'Torre Guaceto e Macchia S. Giovanni' Special Area of Conservation (a designated Natura 2000 site), which encompasses both the Torre Guaceto Marine Protected Area (MPA) and the State Natural Reserve (SNR). For this exercise, each group was provided with the preferred end-state or target developed based on WWF's previous knowledge of the area and the results from in-depth interviews conducted by the case study team prior to the workshop.

During the interactive session, each participant was asked to write two to three problems on red post-it notes, also indicating the geographical area concerned. Once collected, the issues were discussed in the plenary. Participants were then divided into small groups, each of which was assigned with two problems. Each group was asked to outline what they considered to be the main causes of these problems on yellow post-it notes. All causes were shared in the plenary. Potential solutions to such cause were identified in plenary, this time using blue post-it notes.





Regarding potential solutions, participants emphasized the need for:

- reinforced surveillance through collaboration with law enforcement agencies and voluntary citizen involvement.
- research and technological innovation, such as reporting Apps for improving surveillance and for citizen science, essential to address issues such as habitat degradation, pollution, and limited surveillance capacity.

- enhanced advocacy and awareness-raising efforts targeting both institutions and the wider public - tourists, residents, schools, tourism providers, and local businesses,
- support to small-scale fishers in navigating bureaucratic procedures, and to unite and strengthen their voice with institutions and in the marketplace,
- the establishment of co-management tables as a key mechanism to achieving these objectives.

The above further highlighted the need for a system of digital interaction (such as SMART) to deal for improved data sharing and stakeholder participation. The interactive session concluded with a plenary discussion to reflect collectively on how specific interventions and actions could help reach the preferred end-state.

Technical Discussion Session and Piloting

After the interactive session, a technical discussion specifically on the SMART tool was also organised by the team meeting together with Volunteer Ecological Guards (VEG) of the area and MPA Staff. The Smart Conservation Tool was introduced as a potential solution related with implementation of technological tools to improve participation, monitoring and surveillance capacities, responding to the suggestions that emerged on the use of mobile application. Examples of how Smart Tool is being used in different countries around Europe, Asia and America were presented, then a practical pilot demonstration of Smart was performed.

The participants installed the mobile app in their phones, interacting with a form where each user was indicating observations and marking geo-locations. Finally, each user was able to export their observations, completing the data flow proposed. The form was previously developed as an example linked with potential current authorized and unauthorized human activities in the MPA, however, it was clearly explained that a more comprehensive version will be developed together with the MPA staff.





There is an ongoing pilot trial with the participation of 15 Volunteer Ecological Guardians (VEG) and the staff members from the Torre Guaceto MPA, after taking into consideration all the suggestions and recommendations generated during the workshops.

As next steps, the MPA staff agreed to provide detailed information on human activities allowed in the MPA and to participate in the definition of the form, while the VEG agreed to

participate in future training on the SMART Tool. The MPA staff also expressed interest in applying the SMART tool to surveillance activities on land, in the terrestrial reserve, as well as for biodiversity data collection.

To further enhance the useability of SMART, WWF Staff and the MPA Director met the Coast Guard captain of the Brindisi department to discuss the launch of the VEG program to reinforce surveillance in the MPA and how WWF intends to use SMART in its newly launched ELSP project. The Coast Guard expressed interest in the tool and in receiving the data once collected to reinforce the surveillance activities inside the MPA to inform their enforcement actions. The officer also offered to train the VEGs on fisheries legislation and enforcement as well as to host some VEGs patrolling on their vessels.

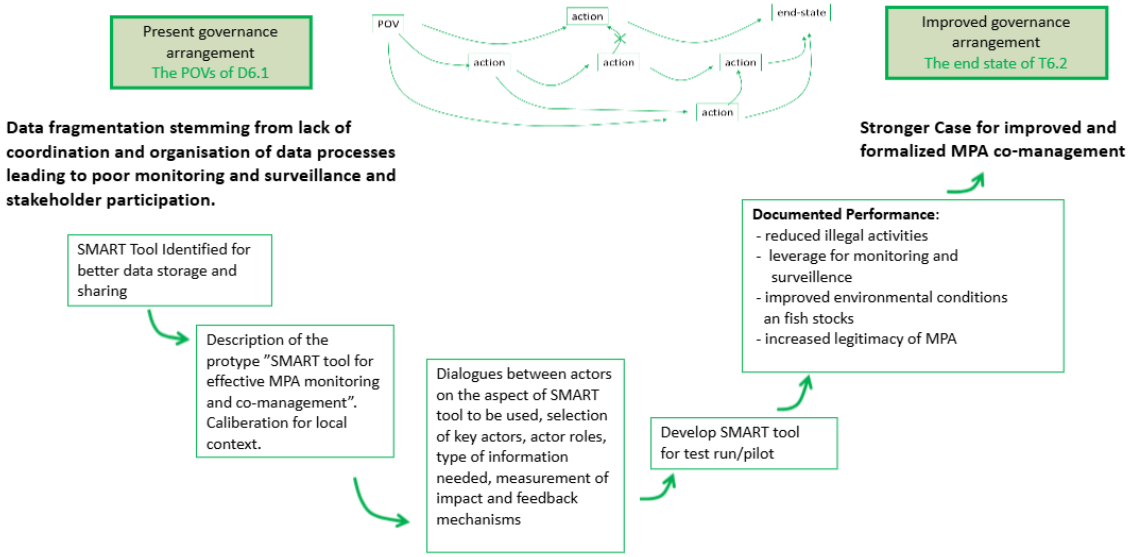


FIGURE 1: SEQUENCE OF ACTIONS TOWARDS SMART TOOL IMPLEMENTATION IN TORRE GUACETO MPA, ITALY.

4.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

The main innovation and change component of the PERMAGOV model related to the governance strategy is the e-governance aspect. This case study proposes to enhance surveillance and monitoring activities within the Torre Guaceto protected area in accordance with its management plan, exploring the potential of a SMART platform as an e-governance intervention under co-management conditions. For this, three principal e-governance components will drive this long-term vision: 1. Seeing & Knowing would be achieved through access to maps and geospatial analysis. 2. Participation & Engagement through stakeholder involvement in a wide range of activities (institutional setup, formal patrols, volunteered information via tracking), and 3. Intervention and Action through direct contribution to law enforcement to address challenges such as illegal fishing.

As the technological platform connects actors through an overarching system of digital interaction, co-management expands its toolkit to face existing and future challenges. As such, the governance strategy relates to other components of the PERMAGOV model including addressing *institutional barriers* relating to the development and use of knowledge, and formality of institutions – the lack of legal recognition of co-management actors (e.g., small-scale fishers) which present challenges that can impact the potential of e-governance for effective implementation; and *collaboration dynamics* - SMART could improve social learning and improved stakeholder collaborations. The use of SMART may depend on actors' capabilities (another important aspect of the PERMAGOV model), particularly relating to resources - both financial and human, actor responsiveness and innovation drive. This is why training in the use of the SMART tool would be crucial. Similarly, the use of SMART would enhance actors' capabilities access to information to make better informed decisions.

4.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

The governance strategy is primarily positioned within the *Creation of alternative Solutions* and partly to *Enhance experimentation.* In terms of creation of alternative solutions, there exist several digital tools and standards for marine governance. The European Green Deal Data Space (GDDS) and the Biodiversity Information System for Europe (BISE) provides the available frameworks. However, these tools and standards largely fall under the top-down control of national and subregional public administrations and leaves MPAs with many responsibilities but insufficient powers to implement them. For example, the Torre Guaceto MPA staff has no legal authority to issue fines against illegal activities within the MPA and usually resort to "moral suasion". On the other hand, there are concerns that enforcement data are often collected but not utilised in the MPA decision-making – all contributing to the management challenges of the MPA.

Thus, we propose SMART tool as an alternative e-governance intervention that streamlines how field data is generated, stored and shared, who participates in decision-making and how MPA information reaches decision-makers. Through stakeholder involvement in a wide range of activities (institutional setup, formal patrols, volunteered information via tracking), the technological platform connects actors to develop new ways of dealing with monitoring and surveillance activities, data sharing and stakeholder engagement to enhance MPA management effectiveness.

Secondly, SMART as a tool has been largely used within non-marine protected areas, with limited implementation within marine protected areas contexts. The implementation of the SMART tool in Torre Guaceto MPA provides an important context to experiment and determine its feasibility and usability, and what actions and processes may be needed to make it work.

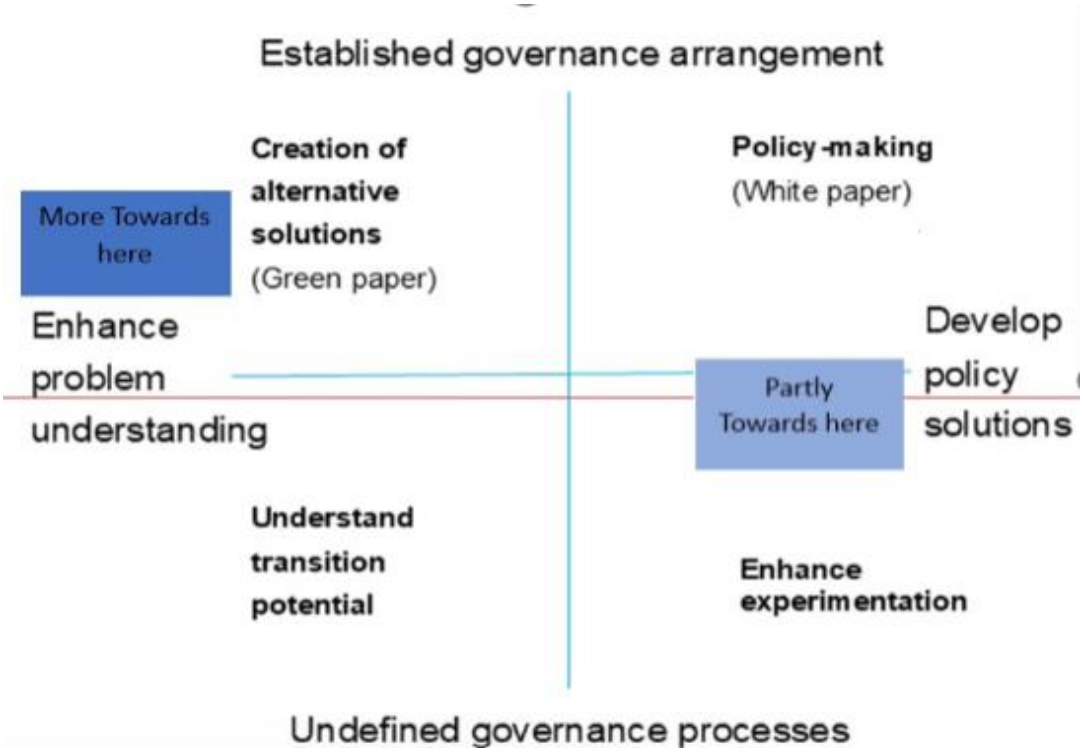


Figure 2: Four-quadrant matrix depicting different types of governance strategies

4.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

SMART Respects ownership of data and adheres to strictest standards of privacy and data security and it is supported by a partnership of eight international NGOs including WWF. Reports generated within the smart tool across various file formats can be shared or transmitted rapidly. The primary risk, however, lies in succumbing to the 'standalone database syndrome'; the core challenge is to ensure that collected information remains fully operational and usable for both co-management activities and the broader public administrative MPA management framework. Although there are no usage fees, implementation requires administrative and operational adjustments. These changes ensure the digital transition aligns with the local management plan, specifically improving capacities for data collection, analysis, and reporting. There are operative and technical limitations that emerge during the tool calibration, piloting and implementation, including user literacy, devices-signal errors and database inputs/outputs updates. In the context of Torre Guaceto MPA, the would be a need for language translation as well. However, these eventualities can be resolved through the co-production process and active stakeholder engagement.

4.4. UPSCALING

SMART is envisioned to be used or experimented within other Italian MPAs where WWF is involved. In Torre Guaceto and Permagov focus is first and foremost on fisheries, but marine plastics/litter and other forms of pollution or illegal activities can be added, raising awareness among users of the MPA and guiding potential intervention. In Torre Guaceto voluntary guards will pilot the tool, but it can be extended to other users such as the Coast Guards who are directly involved in monitoring and surveillance activities. Furthermore, the adoption of this e-governance strategy can be scaled up through the inclusion of ecological monitoring

programs and complementary surveillance instruments such as drones and cameras installed on boats to detect illegal actors.

4.5. REFLECTIONS ON THE METHODOLOGY

The innovation process of this case study required that each of the steps in our research approach be tailored to fit the local context. The design-thinking methodology is largely recognised as a human-centred approach to innovation, but its application and steps of empathy, ideation, prototyping, and testing do not always align perfectly with local realities. Whilst these steps were very clear to the case study team, the situation in our study area made it difficult for us to strictly follow all these processes from start to finish. It was particularly difficult for us to always get key local actors to empathise and ideate with all relevant actors, something further challenged by the limited Italian proficiency of the academic research team. As such, we relied heavily on the end-user for most of the interactions which were sometimes delayed, especially at the early part of the project.

Upon our initial baseline analysis of the key governance challenges through selective key informant interviews, our situation required that we collaborate more with the end-user in the development of a tool which could address specific needs of the MPA rather than following all the steps in the design thinking process. With the end-user's extensive work in the local MPA context, it was easy for them to collaborate with the local key stakeholders (e.g., MPA officials, voluntary guards, fishermen and tourism operators) through workshops to agree on the SMART tool as a potential tool to address their immediate needs. What we missed in this situation is the ability to test the design thinking process itself, but the case highlights important considerations needed in action research. Notwithstanding the challenges, the design thinking methodology enhanced our thinking in the innovation process and the trade-offs between meeting strict research protocols and the implementation of such interventions or innovation in practical terms.

5. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 5: FLOATING OFFSHORE WIND IN THE UK'S CELTIC SEA

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5.1. SHORT CASE DESCRIPTION

The UK's Celtic Sea, covering south Wales, south-west England and west of England, is established as one of the world's largest floating offshore wind (FLOW) project pipelines. Three Project Development Areas (PDAs) were leased in summer 2025 as part of The Crown Estate's Celtic Sea Floating Offshore Wind Leasing Round 5 (The Crown Estate, 2023[30]) and aim to deliver 4.5 GW by 2035. In addition, five Test and Demonstration projects, totalling 440 MW, are moving through the development process (Erebus, Whitecross, Llyr 1, Llyr 2, Morlion/Wave Hub). Spatial potential for a further 12 GW has been identified through The Crown Estate's Marine Delivery Routemap (The Crown Estate, 2024[31]). Therefore, a new FLOW industry in the Celtic Sea is intended to make a significant contribution to delivering the UK's offshore wind ambitions of 43–50 GW by 2030 and broader 2050 net-zero targets.

The development of a new FLOW industry in the Celtic Sea presents a complex set of governance challenges. FLOW development cuts across multiple policy domains, including energy, climate, fisheries, environment, trade, and defence, and therefore demands considerable coordination and collaboration within and across sectors. Through these collaborations, governance actors must manage multiple competing pressures on marine space and navigate inevitable trade-offs in the pursuit of socio-economic, climate, and environmental goals. Furthermore, due to the transboundary nature of the Celtic Sea, governance actors must also coordinate and collaborate across governance scales (international, national, devolved, regional, and local). However, there is no institutional lead on Celtic Sea FLOW in central government, while competitive tensions amongst regional governance actors impede cross-regional collaboration and coordination, increasing the risk of diverging priorities and policy incoherence. This issue is further exacerbated by the current political climate, with strong movements towards independence and devolution in both Cornwall and Wales.

Development of Celtic Sea FLOW is being supported by the Celtic Sea Cluster, one of several offshore wind clusters formed through the Offshore Wind Sector Deal (2019). The Cluster's ambition is to establish the region as a world leader in FLOW by 2030 (Celtic Sea Cluster, 2022[32]). There are several other entities in the region, such as the Cornwall FLOW Commission, the Great South West, and the Celtic Sea Developer's Alliance, that have an interest in different aspects of the FLOW policy agenda, yet there is no single regional body with a remit that spans all relevant policy areas, nor one that possesses the capacity, authority, and resources required to coordinate and drive their implementation effectively. As a result, knowledge, skills, expertise, and resources are dispersed across multiple organisations with overlapping roles and responsibilities, contributing to fragmented policy implementation and resource inefficiencies. The absence of a single unified voice for Celtic Sea FLOW leaves the region vulnerable to changing political priorities at Westminster, and undermines efforts to

[30] The Crown Estate. 2023. Information Memorandum: Celtic Sea Floating Offshore Wind Leasing Round 5. 69pp.

[31] The Crown Estate. 2024. Marine Delivery Routemap: Towards a shared vision for our seabed and coastline. 25pp

[32] Celtic Sea Cluster. 2022. Becoming a world leader in floating offshore wind. The Celtic Sea Regional Strategy for Floating Offshore Wind. 12pp.

secure regional economic, environmental, and social value from FLOW development. Left unaddressed, governance fragmentation means that market forces alone will dictate FLOW development — with value accruing to whoever is best positioned globally, rather than to the communities of the Celtic Sea region.

5.2. DEVELOPING THE GOVERNANCE STRATEGY FOR CASE 5

The design thinking process (ideating-prototyping-testing) was primarily an interactive process, supported by some desk-based work in the testing phase, specifically, the sustainability assessment.

Ideation

Due to the complexity of the governance challenges in Case 5, a single Point of View (POV) was not taken forward to the ideation phase. Instead, four governance challenges, each contributing to fragmentation, were taken forward for deliberation in a workshop setting:

1. The absence of strong institutional leadership on Celtic Sea FLOW
2. Weak connections between decision-makers across sectors and governance scales
3. A lack of transparency on the progress of marine spatial prioritisation in England
4. The absence of a detailed delivery plan for Celtic Sea FLOW out to 2050

An in-person stakeholder workshop was held in October 2025. A total of 20 Celtic Sea FLOW stakeholders participated, representing a diverse range of sectors including offshore wind, fishing, environment, and defence. Representatives of the Welsh Government, the Marine Management Organisation (marine regulator for England) and The Crown Estate also participated.

Participants were divided into four groups, and each allocated one of the governance challenges listed above. In their groups, participants undertook a back-casting exercise, which generated a description of the preferred end-state for each governance challenge, as well as a series of actions to achieve these end-states. Following the workshop, the outputs of the back-casting exercise were written up into a draft workshop report that was shared with all participants. As part of the co-design process, participants were invited to provide feedback on the draft report and add any information in relation to the proposed actions and solution pathways in a process of stakeholder validation. Three stakeholders made further contributions, which were incorporated into the solution pathways.

Analysis of the ideation phase revealed important linkages between the institutional leadership challenge and the other governance challenges i.e. strong leadership, particularly at the regional level, is essential for addressing the other challenges. In addition, during workshop plenary discussions, two key issues were raised repeatedly that underscored the importance of institutional leadership on Celtic Sea FLOW: the need for strong coordination, collaboration, and cross-regional alignment amongst governance actors, and the need to maximise regional benefits from Celtic Sea FLOW.

For this reason, and in agreement with the end-user, actions from the governance solution related to institutional leadership were developed into the D5.3 policy brief and taken forward to the prototyping phase.

By taking forward the institutional leadership governance challenge, the scale of the case focus shifted from governance challenges that hinder the development of Celtic Sea FLOW in the context of achieving national FLOW targets, to governance challenges that hinder regional ambitions and the desire to secure regional benefits from Celtic Sea FLOW. This shift in focus responds directly to the preferred end-state described for this governance challenge in the back-casting exercise:

Institutional leadership on Celtic Sea FLOW reflects regional capabilities, resources, and priorities, with Celtic Sea FLOW driven by a cross-regional governance body with a clear vision and mandate for delivering economic, social, and environmental benefits to the Celtic Sea region.

Prototyping

The prototyping phase was an iterative process that involved the case study lead and end-user scrutinising each of the nine actions in the cross-regional leadership governance solution pathway and adding further details, including identification of prior actions needed, the contribution of each action to the solution, the relationship between the action and the PERMAGOV marine governance model, and potential barriers to implementing the action. This was followed by a series of Celtic Sea FLOW stakeholder engagements, including an online survey, a webinar, and an online meeting that are described in the following sections. These engagements aimed to add further strategic detail, refine and improve the proposed governance solution, and highlight any potential economic, social, and environmental risks associated with the solution.

In February 2026, an online survey was shared with 12 entities that have an interest in Celtic Sea FLOW for the purposes of gathering specific input into three prior actions that were needed to make the solution pathway practical and achievable: (1) Assess level of interest in regional leadership on Celtic Sea FLOW governance; (2) Analyse existing Celtic Sea governance actor mandates and functions; (3) Scope capacity of existing entities to take on a governance leadership role. Five responses were received, with three of the five respondents stating that a new governance model was needed due to the scale of industrial development required to deliver 4.5 GW of FLOW under Leasing Round 5.

A webinar was held in March 2026. Nine Celtic Sea FLOW stakeholders attended, with participants from the environment and fishing sectors, as well as representatives from the Welsh Government, the Department of Energy Security and Net Zero, and the Marine Management Organisation. The Chair of the Celtic Sea Cluster was an invited presenter, who provided context for the establishment of a cross-regional FLOW governance body. The Q&A/feedback session provided an opportunity for stakeholders to comment on the proposed governance strategy.
Later in March 2026, the case study lead held a one-to-one meeting (online) with a member of a national joint industry-government forum focused on coordinating the development and

deployment of FLOW technology. The discussion focused on the wider UK context for FLOW development, offering a high-level strategic perspective on FLOW governance. Advice on the design of a regional governance body using lessons learned from other offshore wind clusters was provided.

Testing

An online workshop was held in April 2026 for the purposes of validating the governance strategy. Seven Celtic Sea FLOW stakeholders participated, with representatives from RenewableUK, Cornwall Floating Wind Commission, Offshore Renewable Energy Catapult, the environmental NGO sector, and an offshore wind project developer whose company secured a seabed lease in Leasing Round 5. Participants were invited to deliberate on key questions related to the governance of Celtic Sea FLOW, to share their perspectives on regional leadership as a governance strategy, and to reflect on the risks associated with a regional leadership approach. Further testing was undertaken by the end-user, whereby a summary of the governance strategy was presented to individual stakeholders for feedback and input.

Discussions about risk continued in May and June 2026. Several meetings were held with the chair of the Celtic Sea Cluster to discuss emerging political and resource-related risks following the national election in Wales and the local elections in England (May 2026), which have the potential to hinder implementation of the governance strategy.

A desk-based sustainability assessment was undertaken by the case study lead in collaboration with the end-user. The governance strategy was assessed against the following Sustainable Development Goals:

- SDG 7: Affordable and clean energy
- SDG 8: Decent work and economic growth
- SDG 9: Industry, innovation and infrastructure
- SDG 11: Sustainable cities and communities
- SDG 14: Life below water
- SDG 16: Peace, justice and strong institutions

5.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

Current collaboration dynamics within the Celtic Sea region are constrained by regional competition among FLOW governance actors and by institutional attributes that are ill-suited to supporting actor connectivity within and across governance scales, thereby reducing opportunities for collaboration, knowledge exchange, and social learning. The governance strategy responds to an identified need for a single unified voice for Celtic Sea FLOW, as well as improved collaboration, coordination, and alignment across the Celtic Sea region. This need was originally formulated as a POV of the Celtic Sea Cluster but following a series of

stakeholder engagements in the design thinking process, it is now understood as a need that is shared by multiple Celtic Sea stakeholders within the UK jurisdiction.

The governance strategy offers a pathway for aligning national FLOW ambitions with regional priorities, enabling a more collaborative approach and drawing upon the region's diverse knowledge, expertise, and capabilities to advance FLOW ambitions. A central feature of the governance strategy is the creation of a Celtic Sea FLOW governance body. The remit of the FLOW governance body will be agreed by its members. For example, it could focus on driving delivery, including accelerating planning and consenting, or it could adopt a more strategic role, serving as a boundary-spanning institution that bridges fragmented governance arrangements for the purposes of coordinating governance actors, driving policy coherence, and ensuring FLOW development is responsive to the specific economic, environmental, social, and cultural contexts across the region.

The governance strategy consists of four strategic objectives and associated strategic actions:

Strategic Objective 1

Establish a shared Celtic Sea identity and vision for Celtic Sea FLOW.

Strategic actions:

1.1 Identify key components of a shared Celtic Sea identity and vision for Celtic Sea FLOW.

1.2 Agree geographical scope for ownership of a shared Celtic Sea identity and vision for Celtic Sea FLOW.

Strategic Objective 2

Define the overall mandate of a regional FLOW governance body.

Strategic actions:

2.1 Agree on specific goals and objectives of the governance body

2.2 Determine scope of work/core pillars. These could include:

- Regional economic development and inward investment
- Infrastructure development (e.g. ports and grid) and integration across assets
- Strategic marine spatial planning
- Stakeholder engagement and public acceptance
- Environmental stewardship
- Social value (e.g. skills and workforce development)

Strategic Objective 3

Determine the design of a regional FLOW governance body

Strategic actions:

3.1 Review governance models from other sectors and from fixed-bottom wind (including international models).

3.2 Select (or design) a cross-regional governance model.

3.3 Design institutional attributes and processes e.g. eligibility for participation in the Celtic Sea FLOW governance body, allocation of roles and responsibilities, accountability mechanisms, conflict mechanisms etc

Strategic Objective 4

Operationalise the Celtic Sea FLOW governance body

Strategic actions:

4.1 Identify a route to funding for the Celtic Sea FLOW governance body.

4.2 Empower Celtic Sea FLOW governance body with appropriate level of power and authority

4.3 Establish a regional governance body-government forum

The governance strategy focuses on the establishment of a new Celtic Sea FLOW governance body and is therefore primarily concerned with the Collaboration Dynamics and Institutional Attributes components of the MLCMG model.

The process of establishing a shared Celtic Sea identity and vision for Celtic Sea FLOW (Strategic Objective 1) lays the foundations for principled engagement and shared motivation as it enables members of the governance body to identify individual and shared interests, articulate common objectives, and build mutual trust and understanding. The process is also likely to surface underlying tensions, competing perspectives, and areas of conflict and disagreement. While challenging, confronting these tensions will enable members of the governance body to identify trade-offs, reconcile competing interests, and develop more adaptive and collaborative approaches to decision-making on Celtic Sea FLOW.

Defining the mandate and design of the governance body (Strategic Objectives 2 and 3) and operationalising the governance body (Strategic Objective 4) are important institutional design processes. Well-designed institutional attributes will enhance capacity for joint action by creating the conditions necessary for sustained coordination and collective action across governance scales, enabling members of the governance body to work towards the delivery of a shared vision for Celtic Sea FLOW.

The governance strategy focuses on the *creation of alternative solutions* as it seeks a new way of approaching coordination and collaboration challenges within an established governance arrangement. The strategy sets out a roadmap for the formation of a regional

Celtic Sea FLOW governance body that has the mandate for leadership on FLOW planning and development. The governance body is co-designed by different types of actors who own the proposed actions. For example, the new body could be based on an expanded mandate of existing entities such as the Celtic Sea Cluster or the Cornwall FLOW Commission, through which regional actors can assume a more prominent role in FLOW governance and influence recognised policy processes. From this perspective, the strategy also incorporates elements of enhanced experimentation.

5.3.1. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

Sustainability risks (against SDG criteria)

Improved regional leadership on FLOW governance may accelerate FLOW development and deployment, which generates the following sustainability risks:

SDG 7: Affordable and clean energy

FLOW is a new technology and therefore requires substantial upfront investment in turbines, foundations, and transmission infrastructure. If development costs are high and not offset by technological improvements or policy support, electricity prices for consumers may increase. With reduced affordability, there is a risk of public opposition to FLOW development, which can delay projects or increase development costs further.

SDG 8: Decent work and economic growth

Accelerated FLOW deployment has implications for access to decent work in the fishing sector due to the risk of displacement, income loss, and increased operating costs. The prospect of increased travel distances, raised fuel costs, reduced catches, and an overall loss of income, contributes to job insecurity, particularly for smaller vessels that have fewer alternatives.

SDG 9: Industry, innovation and infrastructure

Without appropriate investment in UK port infrastructure and domestic supply chains, there is a risk that an accelerated pace of FLOW development and deployment will result in economic benefits of FLOW being captured outside of the UK, constraining growth and innovation in the UK's emerging FLOW sector.

SDG 11: Sustainable cities and communities

Although FLOW has the potential to generate significant economic benefits for coastal communities across the region, there is a risk that economic gains primarily accrue to developers and external contractors while coastal residents experience years of disruption, including negative impacts on tourism, local heritage values, and community identity.

SDG 14: Life below water

There may be a risk to vulnerable species and habitats if the governance solution leads to an acceleration of FLOW deployment without appropriate consideration of cumulative environmental impacts.

SDG 16: Peace, justice and strong institutions

There is a risk that the governance solution limits procedural justice. Although, the establishment of a Celtic Sea FLOW governance body is intended to broaden stakeholder participation in governance processes, this outcome will only be achieved if the boundary rules that determine eligibility are inclusive of diverse knowledge and values.

Political risks

The establishment of a regional Celtic Sea FLOW governance body is intended to overcome challenges associated with a fragmented governance system. However, recent political developments have increased the risk of further fragmentation, which, on occasion, have been for reasons unrelated to the offshore environment. Cornwall Council has opposed the establishment of a strategic mayoral authority for the South-West and instead passed a motion calling on the UK Government to formally recognise Cornwall as the fifth nation of the UK, alongside England, Scotland, Wales, and Northern Ireland, in view of its unique history, culture, language, and identity. Although Cornwall secured a Level 2 Devolution Agreement in 2023, Cornish councillors are now seeking a more meaningful devolution settlement, creating uncertainty about Cornwall's constitutional future.

Following the national elections in Wales in May 2026, Plaid Cymru is now the largest party in the Welsh Senedd. Plaid Cymru has a nationalist agenda and is seeking greater Welsh autonomy over key aspects of offshore wind development in North, Central, and South Wales waters, particularly seabed leasing, governance, revenues, and ownership, so that more of the economic benefits are retained within Wales. This could create additional layers of coordination between Cardiff and Westminster and introduce institutional complexity for a new cross-regional FLOW governance body.

In July 2026, a new UK Prime Minister was appointed, together with a new Secretary of State for Energy and Net Zero, which has introduced new actors into the governance arrangement. It is unclear how energy policy and the wider 'rules of the game' (e.g. in relation to devolution and the implementation of the English Devolution and Community Empowerment Act 2026) will evolve under this new leadership, creating a degree of uncertainty and risk for any new Celtic Sea FLOW governance body that will need support from Westminster to secure formal powers and authority.

Great British Energy (GB Energy), established in 2023 as an operationally independent company wholly owned by the Secretary of State for Energy Security and Net Zero, is seeking to address many gaps in delivery of current UK clean energy ambitions but its role in FLOW governance and influence in policy areas such as marine spatial planning are yet to be determined. The lack of clarity on the role of GB Energy, as well as other national investors such as The Crown Estate and the National Wealth Fund, creates uncertainty over roles,

responsibilities, and accountability mechanisms, and risks the development of a Celtic Sea FLOW regional strategy that is based on incorrect assumptions about available support or future investment.

Resource-related risks

The funding landscape for local economic development is highly fragmented, with splits at the local, regional, and national levels, as well as across strategic sectors. The Celtic Sea Cluster identified access to sustainable sources of funding as a major barrier to progressing their work in the region, and it continues to present a major risk to the adoption and implementation of a new regional governance approach. Many existing industry-scale support bodies are directly resourced from private members (e.g. Renewable UK, Marine Energy Wales, Offshore wind Industry Council) but this approach may not be appropriate for an independent regional body seeking to build public trust.

The Celtic Sea Cluster is undergoing a period of transition as a new Chair is appointed. The change in leadership presents a risk to the stability of the Cluster and its capacity and willingness to take on a regional leadership role on the governance of Celtic Sea FLOW. Knowledge and relational resources have already been affected by the leadership transition.

5.4. UPSCALING

Upscalable messages:

1. **Establish a mechanism to embed regional governance into the broader offshore wind governance architecture.** Offshore wind is a national opportunity, but regional and local governance actors are best placed to understand how to secure environmental, economic, and social value from offshore wind development. Strengthened regional governance can also assist with overcoming scale issues by providing a connection between national and local tiers of governance.

2. **Secure public acceptance through improved stakeholder participation and increased transparency of decision-making.** Public acceptance of offshore wind development is more likely when stakeholder engagement processes are meaningful, inclusive, and capable of influencing outcomes. Consultation should move beyond information provision towards genuine participation, where stakeholders are able to contribute local knowledge, identify concerns, and help shape decisions throughout the offshore wind project lifecycle. Stakeholders need to understand how and why their knowledge is used (or not) in decision-making. This is particularly important for groups that may bear disproportionate costs, such as fishing communities and coastal residents.

3. **Foster social learning and reflexivity amongst governance actors.** There are significant opportunities to learn from 25 years of fixed-bottom wind deployment in the UK and EU, as well as from the oil and gas industry in the North Sea. This learning should move beyond the transfer of technical knowledge to include reflection on previous governance successes, failures, and unintended consequences. For example, offshore wind projects in earlier leasing rounds have highlighted the importance of early and

continuous stakeholder engagement, adaptive marine spatial planning, and cumulative impact assessments. Similarly, the oil and gas industry offers valuable insights into workforce development, environmental monitoring, and the management of complex, offshore infrastructure. A reflexive approach enables governance actors to challenge existing assumptions, identify emerging risks, and adapt policies in response to changing economic, environmental, and technological conditions. By creating a culture of continuous learning and adaptation, governance actors can improve decision-making, strengthen institutional capacity, and support a more coordinated and just low-carbon transition.

4. **Adopt a sea-basin governance approach.** The Celtic Sea basin has FLOW development interests in the UK, Ireland, and France, presenting an opportunity for collaboration across international borders to better meet common needs and challenges e.g. management of mobile species, fisheries displacement, infrastructure provision, skills development.

5.5. REFLECTIONS ON THE METHODOLOGY

The design thinking methodology was new to the case team and took time to fully understand as a methodology to be applied in the case study. The flexibility of the process was important as it enabled the case team to adapt the process as they learned and moved through the design thinking phases.

The back-casting method was mostly straightforward to apply, although some stakeholders found it challenging to identify and sequence the individual actions. Selection of the actions, done by the case lead and end user, was straightforward due to the focus on establishing a Celtic Sea FLOW governance body, which required a logical stepwise process.

Validation of the governance strategy was more challenging as it required extensive stakeholder engagement in a case where there are high levels of stakeholder fatigue. However, the end-user was able to make use of existing relationships to ensure that this task was undertaken effectively.

6. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 6: DANISH ENERGY ISLANDS

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6.1. SHORT CASE DESCRIPTION

Case 6 “Energy Islands in Denmark” focuses on the planning, development, and implementation aspects of two Energy Islands planned in Denmark - one on the Danish island Bornholm, and one in the North Sea. The Islands function as ‘collection points’ for energy produced by surrounding offshore wind farms and will transmit energy between European countries in the future.

Institutionalized in Denmark in 2020, these islands have faced significant drawbacks and issues in a brief period, culminating in the indefinite pause of both islands, where only the Bornholm island has been re-started by January 2026. To clarify this, we offer here a perspective of the Danish EI case status quo to use as a frame of reference for the remainder of this report:

- After the EI’s institutionalization in Danish policies in 2020 [33], both EIs have faced significant drawbacks primarily due to economic concerns. The economic fallout of COVID-19, the Russia-Ukraine war of 2022, political tensions between the EU and the USA have generated both economic tensions and rising inflation, meaning the original 2020 framework developed for the Danish EIs were no longer fit for purpose. These concerns further complicated establishing clear collaboration between both national and international partners, causing further concerns regarding the projects’ feasibility. Consequently, the scope of both projects had to adapt as the projects were running[34].
- The situation further left no incentives for the offshore wind industry to engage with the surrounding offshore wind infrastructure tenders led by the Danish government. Consequently, no bids were made for any offshore wind projects. This instituted a large-scale market analysis to determine the factors of this outcome[35]. To mitigate this effect, new tenders include a *Contract for Difference*, meaning the Danish government and a potential tender applicant will agree on an energy price baseline. Energy prices are in a constant state of fluctuation - should the price drop below this baseline, the Danish government will pay the difference, ensuring the developer will always receive a minimum price[36].

[33] Danish Government, ‘Tillæg Til Klimaaftale Om Energi Og Industri Af 22. Juni 2020 Vedr. Ejerskab Og Konstruktion Af Energiøer Mv.’, Government of Denmark, 2021 <https://kefm.dk/Media/5/E/Aftaletekst%20-%20Energi%C3%B8er%20-%20Ejerskab%20og%20konstruktion%20af%20energi%C3%B8er%20mv.pdf>.

[34] Sun Cole Seeberg Dyremose, ‘Big Projects, Political Ambitions and Preparing for the Green Energy Transition - the North Sea Energy Island in Denmark’, *Maritime Studies 2025 24:2*, 24.2 (2025), pp. 1–16, doi:10.1007/S40152-025-00427-Y.

[35] DMCEU, ‘Ingen Bud På Havvindmølleparker: Opklaringsarbejde Er Igangsat’, in *Klima- Energi- Og Forsyningsministeriet*, December 2024 <https://www.kefm.dk/aktuelt/nyheder/2024/dec/ingen-bud-paa-havvindmoelleparker-opklaringsarbejde-er-igangsat>.

[36] Danish Government, *Aftale Om Udbudsrammer for Tre Havvindmølleparker* (Danish Government, 2025) <https://www.kefm.dk/Media/638832600830188706/Aftale%20om%20udbudsrammer%20for%20tre%20havvindmlleparker.pdf https://www.kefm.dk/aktuelt/nyheder/2025/maj/ny-politisk-aftale-om-groen-stroem-fra-havvindmoeller-bidrager-til-et-groennere-og-mere-sikkert-danmark>.

- The Bornholm Energy Island has received status as a *Project of Common Interest* within the EU, meaning it would be possible for the project to acquire funding via the *Connecting Europe Facility Fund* [37]. The Baltic Energy Island consortium applied for this, and was granted 645 million Euro in support [38]. To keep these funds, the Danish government decided to reinstate the Bornholm project by January 2026, despite potential risks [39]. This show of goodwill has since resulted in a deal between the Danish and German governments on specific funding for the Bornholm Island projects, and the cabling infrastructure surrounding it [40].

Because of this, the Energy Islands case has changed during the PERMAGOV project period. Initially, questions about the feasibility of EIs were a focus, ruminating the divergent social, environmental, political, and economic aspects that influenced the projects' outcome. Given their turbulent development phase, increasing geopolitical tensions and subsequent delays due to economic uncertainty, this focus has since turned towards the implications of the EIs' implementation, and their role in the path towards decarbonization within the EU. The combined energy crisis and EU call for energy independence put pressure on large-scale offshore megastructures like EIs, which contradicts the otherwise drawbacks and prolonged delivery period of the projects. Real-life development has introduced an unprecedented governance challenge in implementation of EIs, and this case seeks to highlight the experiences and insights from closely following these projects for four years.

Below we present the output of these endeavors, which has culminated in a proposed governance strategy to ensure the success of the Energy Islands as a key contributor to sustainable energy development in the future.

6.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 6

In sum, the case is developed with the purpose of identifying how large-scale, innovative energy solutions like Energy Islands can contribute to Green Deal Goals for decarbonisation. Specifically, the case has identified governance barriers surrounding the EIs' development, identified how political agenda-setting is not always conducive to real-life practical circumstance, and a lack of

[37] EC, 'ANNEX to the COMMISSION DELEGATED REGULATION (EU) …/... Amending Regulation (EU) No 2022/869 of the European Parliament and of the Council as Regards the Union List of Projects of Common Interest and Projects of Mutual Interest', in *EUR-Lex*, European Commission, November 2023 <https://eur-lex.europa.eu/resource.html?uri=cellar:8343d7e8-8de6-11ee-8aa6-01aa75ed71a1.0007.02/DOC_2&format=PDF https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM%3AC%282023%297930&qid=1704358152782>.

[38] EC, 'CEF Energy Supports Landmark Bornholm Energy Island Interconnector between Denmark and Germany - European Commission', in *European Commission*, September 2025 <https://cinea.ec.europa.eu/news-events/news/cef-energy-supports-landmark-bornholm-energy-island-interconnector-between-denmark-and-germany-2025-09-04_en>.

[39] Else-Marie Flarup W. Johansen, 'Pausen Er Aflyst: Regeringen Giver Grønt Lys Til Stor Kontrakt Om Energiø Bornholm | Politik | DR', in *DR*, August 2025 <https://www.dr.dk/nyheder/politik/pausen-er-aflyst-regeringen-giver-groent-lys-til-stor-kontrakt-om-energioe-bornholm>.

[40] DMCEU, 'Danmark Indgår Aftale Med Tyskland Om Energiø Bornholm', in *Danish Ministry of Climate, Energy and Utilities*, January 2026 <https://www.kefm.dk/aktuelt/nyheder/2026/jan/danmark-indgaar-aftale-med-tyskland-om-energioe-bornholm->.

common approach in dissemination of knowledge between a diver set of actors within the project. Due to the EIs complexity, many technological, environmental, social and political dynamics are intertwined within the case; because of this, use of knowledge is often fragmented. To this end, the governance strategy should allow for flexibility. From this process, the Case will provide in-depth insights to the practicalities of this implementation and provide an overview of steps necessary to successfully integrate Energy Islands in the current political climate.

Considering current developments, rather than a dual focus on both the North Sea and the Baltic (Bornholm) EIs, the case focuses only on the latter, in addition to the infrastructure that will be surrounding it. This also meant that the Governance strategy proposed here targets the contemporary developments in the Danish EI project. As such, any future developments that induce a change to the EI planning and development would simultaneously require adaptations to this governance strategy.

The Governance strategy is developed with viewpoints from multiple different actors' interests and needs in mind. This process is divided in preparation-ideation-prototyping-testing phases, see figure **Error! Reference source not found.**:

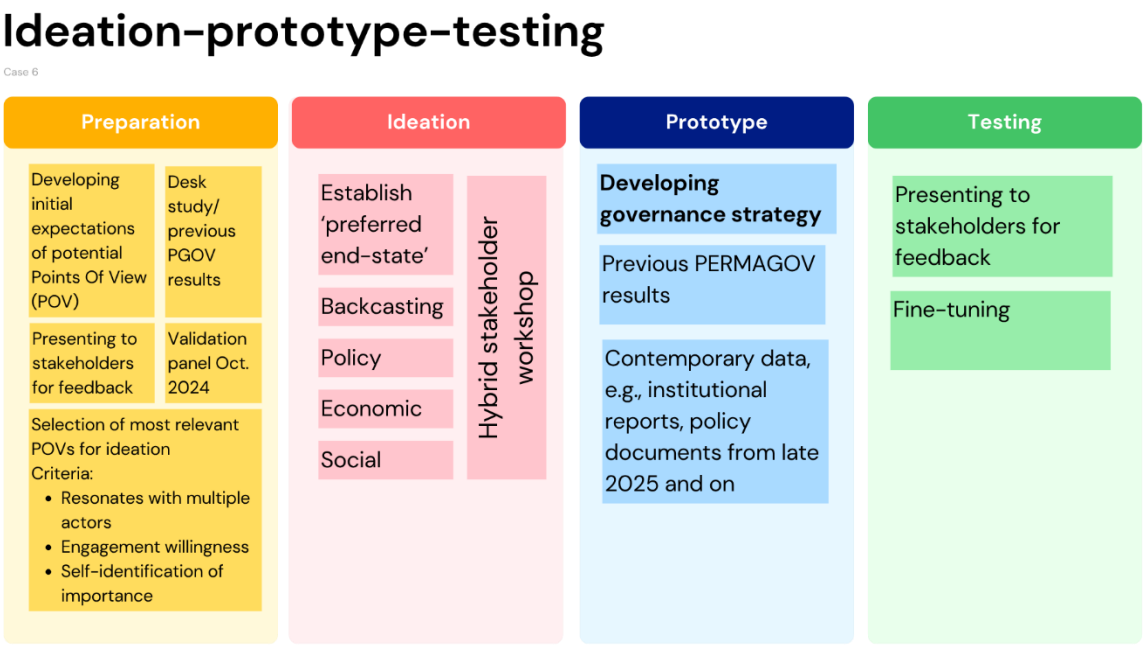


FIGURE 1 OVERVIEW OF IDEATION-PROTOTYPE-TESTING PHASES FOR CASE 6

In the preparation stage, we identified which specific needs and Points of View (POV, a specific stakeholders' perceived needs to ensure their capability to engage with the case in point) was present among stakeholders regarding offshore wind and Energy Island development.

To do this, we developed an initial expectation of what these POVs might entail. This was based on both previous PERMAGOV results (especially results from work packages (WPs) 4 and 5) and relevant literature, e.g., project reports, communications from the EU and other governmental units, Danish legislation and policy plans and published academic articles on the topic. In T6.1, we mitigated this by establishing POV that would allow for nuance and established these three selection criteria: 1) that the POV resonates between multiple actors, 2) that the POV belongs to

an actor willing to engage and 3) is what the actor themselves identified as most important. Considering the divergence of the North Sea and Bornholm EIs, we chose to establish a POV for each. This provided an initial 'status quo' which we might then present to stakeholders as a starting point for further discussion.

Afterwards, we hosted an online stakeholder workshop, a 'validation panel', where stakeholders were invited to share further input so that we might adjust our initial expectations. This panel took place in October 2024. We presented our initial findings and expectations, and stakeholders were invited to provide feedback based on their own interpretations. This process served to further specify which POVs were the most relevant to bring further to the ideation phase. Here, stakeholders were asked to propose what they saw as an ideal outcome to the implementation of EIs, and the utilization of offshore wind in general for decarbonization, or their *preferred end-state.*

October 2025, we hosted a hybrid stakeholder workshop in Nordic Folkecenter for Renewable Energy facilities for this purpose, where three interactive workshops followed a row of presentations from different stakeholders and the case team. Considering the complexity of the case, the three workshops focused on specific themes: Policy, Economic and Socio-cultural impacts. Having identified the preferred end-state, it was a matter of identifying which specific actions were required to achieve it. To this end, we conducted a backcasting exercise.

For this exercise, we asked stakeholders in each workshop to identify specific steps needed to achieve the preferred end-state.

From this, we could develop a prototype of the marine governance strategy to be applied. We combined results both from the stakeholder workshops and newly released documents which more accurately could reflect trends and developments, e.g., institutional reports and policy documents published from late 2025 and on. This prototype has yet to undergo testing and fine tuning.

TABLE 1. DESIGN THINKING PROCESS TO DEVELOP INNOVATIVE GOVERNANCE STRATEGIES IN PERMAGOV

Phase	Objective
Ideate	In the ideation phase we engaged with stakeholders to identify specific actions/steps to take to achieve a preferred end state. From the perspective of increasing deployment of offshore wind infrastructure, including EI infrastructure, specific steps identified in the Bornholm case are as follows: ***Increasing transparency in local dissemination processes:*** Citizens and local political actors on Bornholm need transparent and inclusive governance of the Energy Island project. They are concerned about limited local influence, social and environmental impacts, and the need for fair sharing of both benefits and burdens. This POV relates to governance challenges of procedural

justice, legitimacy, and place-based engagement. Addressing this requires improved collaboration dynamics and legitimacy in the governance process [41].

Reorganizing priorities regarding profitability in OWP projects: Industries are more worried about global standard/geopolitical challenges than locally providing energy – companies are waiting for better (economic) conditions

Acknowledging cause-and-effects in international decision-making: EU states 'move together'. This strategy may heighten cross-border collaboration and help generate an independent EU-centric energy network. However, this interdependency risks creating ripple effects in case an issue arises with one nation. Stalling of one party could mean stalling of others.

Establishing Contracts for Differences (CfDs): CfDs, an agreement between an OWP developer and the Danish state in which the state pays the difference should the energy price drop below an agreed baseline. This ensures a profit for the developer and makes applying for tenders more attractive. This is the key for ensuring the deployment of offshore wind turbines. Without these, the BEI would be ineffectual.

a. An issue with this is however that Danish taxpayers would be paying for large OWP companies to construct OWP. This bears social implications not yet fully understood or engaged with.
b. Moreover, it would be necessary to consider balances in what 'works' – attractive state tenders work, but only for big, very established OWP developers. Smaller actors thus cannot compete with large tenders, and with the closing of the open-door scheme in 2023 this is more challenging [42]. Utilize the full range of capable developers for more things than just OWP and allow for this flexibility

Recognizing dynamics beyond energy market developments. While economic circumstances have been a high driver for the EI project, implementing OWP solutions will not work if development is left solely to the market. States need to regulate and make companies engage with new independence frameworks

Focus on developing/scaling up critical energy infrastructure. Critical infrastructure development (energy grids, onshore and offshore) must be constructed alongside OWP. Without it, energy produced by offshore wind turbines will not be connected to main energy infrastructure, rendering them idle.

[41] Falk-Andersson, J., Christina Kelly, Nelson F. Coelho, Moses Adjei, Riku Varjopuro, Luke Dodd, Päivi Haapasaari, Sun Cole Seeberg Dyremose, Gitte Davidsen, Daniele Pagani, Jane Kruse, Shannon McLaughlin, Antoine Lafitte, Lindsey West, Kåre Nielsen, Neil Farrington, Judith van Leeuwen, Ben Boteler, Cristian Passarello, Helder Pereira, Andreas Kortenhaus, Matteo Alexander Nenciolini, Giulia Prato, Andrea Zanella, Troels Jacob Hegland (2025, unpublished). "Deliverable 6.1 Co-production of joint problem statements and actionable insights". PERMAGOV project.
[42] DMCEU (2023) 'Åben dør-ordning lukkes'. Available at: https://kefm.dk/aktuelt/nyheder/2023/dec/aaben-doer-ordning-lukkes.

	Additionally, current grid infrastructures do not have the required capacity to manage the new influx of GW. **Plan flexibly and utilize lessons learned to foresee future obstacles.** Geopolitical circumstances heavily influence how sustainable projects are implemented, and rapid changes can cause delays as projects are paused for reassessment. This delays implementation of solutions; limits trust in policy processes and enhances uncertainty. When this happens, stakeholders are less inclined to engage with sustainable solutions. Mitigating this effect can be done if solutions are prepared beforehand.
Prototype	As stakeholders highlight high complexity and a need for flexibility, the prototype proposed enables a modular structure for decision-making. This is for two reasons; it requires building upon already established experience; something built over the past 5-6 years of policy and planning for the BEI. Second, it is a way to mitigate the tendency of bigger projects to frequently find setbacks due to unforeseen circumstances. In this way, a plan can be established where expected outcomes are more easily defined because the steps to reach the completed projects can be laid out in a linear sequence, much like building blocks, or 'Lego-blocks' (Flyvbjerg and Gardner, 2023). Uncertainty has been a prominent factor in the BEI development, and a clear plan from offset is a way to mitigate this effect and increase stakeholder certainty in the project's feasibility. Stakeholders emphasise e.g., that: retaining a 'wait-and-see' approach is deemed a losing strategy as is delays sustainable development and counteracts EU competitiveness. For example, Europe traditionally builds RE-solutions that are adopted by other continents, e.g., the US then buys and resells when they become commercial. Europe shouldn't wait for materializing from others but realize Europe is a global market capable of self-sufficiency. In addition, streamlining the use of Marine Spatial plans can be a way to mitigate the fragmentation across different nationalities and foster clearer collaboration. Those who move forward and act end up winning – someone has to be willing to go first. "The fastest way to lose a war is to wait until you have better information" (Economic table, workshop 2). Building a hydrogen pipeline is an example of a first step, but it doesn't make sense if there is no demand for it on the other end. The first 'risky' step should be sensible and there should be certainty that someone will pick up on it Stakeholders moreover note that the EU and national governments should put further focus on a variety of RE-solutions in addition to offshore megaprojects. Technologically, it would not be sensible to focus on only one type of RE. Integrate other RE-solutions as well like solar or geothermal, and enforcing this in policy decision-making could be a pathway for smaller actors to engage with sustainable energy solutions as well. TSOs and energy ministries manage both implementation of new solutions in addition to expansions of grid infrastructure, and coordinating with other actors

in the 'practical' settings of solutions development. Allocating more resources for these institutions would help to ensuring retainment of personnel, thus limiting project points getting lost in translation

The challenging geopolitical tensions have brought certain weaknesses within the EU to light, which has generated momentum for sustainable RE-solutions in general. The discourse could be shifted to focus on what can be done and is being done to show progression and retain this momentum.

6.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

6.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

The governance strategy for Case 6 focuses on the policy process *en lieu* with practical implementation of the EIs as a solution for the green energy transition, aligned with the EGD. Their planned deployment culminated in a 'policy problem', in which significant impact on a large variety of stakeholders, physical spaces and environments have been identified. Thus, our proposed strategy has two strategic objectives: 1) understanding the interconnective nature of challenges, policies and specific actions needed; 2), due to the interconnective nature of the barriers addressed, a governance strategy should employ a clear, modular structure that considers both the complexity, but also leaves the option to readdress should unforeseen circumstances be introduced at random, as has been the case in earlier developmental phases.

In **understanding the interconnectedness of challenges, policies and needed actions**, we introduce the following figure 2:

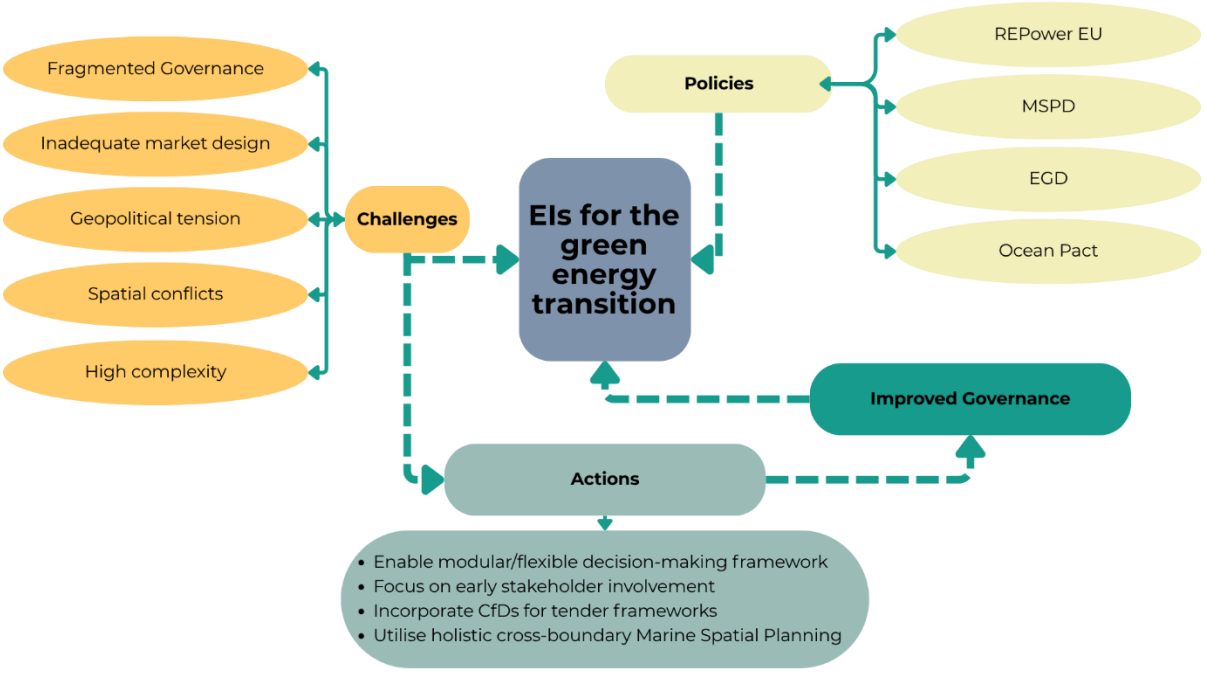


FIGURE 2 OVERVIEW OF GOVERNANCE STRATEGY

It is found necessary to identify the interrelations of moving parts within the BEI case, as this will generate the knowledge and experience needed for a modular decision-making process. Stakeholders do overall have high capability to engage with, assess and employ proposed policy solutions, though smaller local stakeholders report a lack of resources (time, personnel, funds) to do so [43].

In this, it is important to keep in mind that the actions needed to reach the preferred end-state might bring detriment to other areas of development; should, for instance, the Bornholm EI be implemented, it solves an urgent call for enhancing electrification. However, the inland energy hub will cause a significant spatial change on Bornholm, shifting previous use of that same space. To help foresee these conditions, **following a modular structure in decision-making** is proposed as the second strategic objective, see Figure 3:

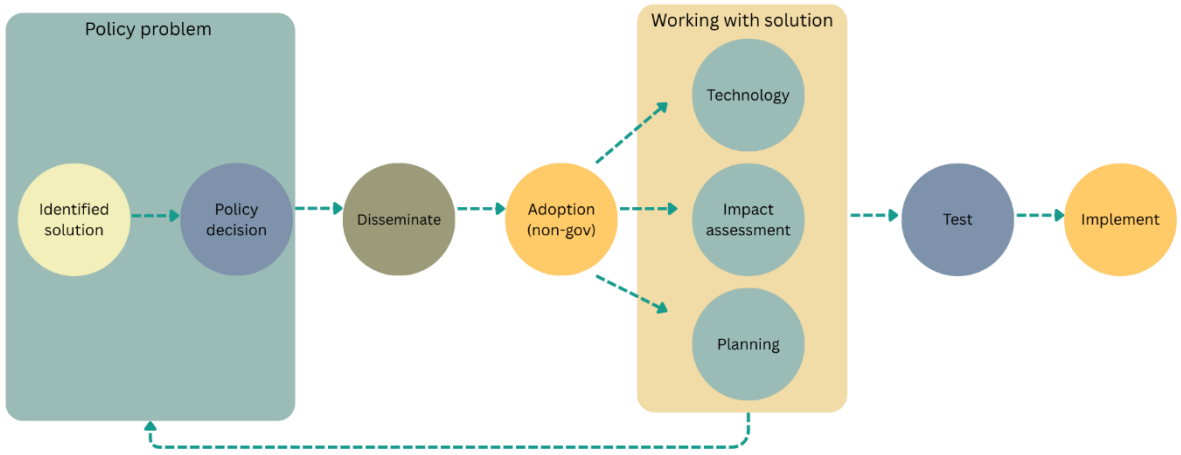


FIGURE 3 PROPOSED MODULAR STRUCTURE FOR APPLYING SUSTAINABLE SOLUTIONS IN PRAXIS

In sum, an identified policy problem (need for renewable energy infrastructure upscaling) promoted an identified solution (EIs and OWP), which is institutionalized via policy decision-making. This solution is disseminated further to non-governmental actors, who are responsible for employing it in praxis. In the EI case, there are technological, environmental, and planning aspects to be considered. Should the employed solutions not be fit for purpose, it would 'return' to the policy drawing board for reiteration. If it is found fit for purpose, it should go for testing and implementation.

6.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

The strategy is closely related to the institutional attributes as this influences the barriers and enablers of policy adaptations, yet it is important to underline that an adaptation will not

[43] t Varjopuro, R. and H. Toonen (2024). PERMAGOV Case Study Assessment Report. Report on the Assessment of Governance Capabilities. PERMAGOV. Deliverable 5.2.

necessarily result in improvements (van Noort et al. 2025). Considering the adaptations in OWP and energy island development being heavily influenced by economic focus, there is a similar concern that e.g., CfDs, risking the first move etc. are solutions adopted that may improve industry engagement with the projects, but to detriment at Danish national economy or environmental or social considerations.

Collaborative dynamics similarly play a key role, considering the large network of actors directly or indirectly involved with the Energy Islands. To solve complex issues, then, establishing collaboration across institutional boundaries (van Noort et al. 2025) via principled engagement, shared motivation and capacity for joint action (Emerson et al. 2012) are key.

Governance capabilities consider the capability to manage observed problems. In D5.2, actors were individually assessed with respect to this, and it was found that overall, stakeholders do have the ability to engage with and solve complex problems, i.e. working towards deploying sustainable solutions within their own institution and working in tandem with sustainable policy directions. Especially industry and governmental actors are well-established and thus in possession of resources (time, personnel and/or funds) to engage with and solve problems, where local actors report a lack of these. External circumstances, e.g., economic conditions, geopolitical tensions and/or changes in established policies, however, create barriers for engagement regardless of the individual stakeholders' available resources.

6.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

The governance strategy is related to strongly recognized policy processes and aims to influence these processes by highlighting strategy alternatives or additions. Decision-making in the BEI case has been rushed due to an immediate need for sustainable energy solutions and thus becomes a risk of oversight. To mitigate this, this governance strategy offers a modular approach to decision-making in a simple step-by-step guide in implementing solutions. In context of differentiating strategy types, we establish Case 6 between **Creation of alternative solutions** and **Policymaking.** For the former, the strategy seeks to influence recognized policies by strengthening the knowledge-base in decision-making. For the latter, the strategy contributes to recognized policy processes building on experience built over the past 5-6 years since the BEIs initial institutionalization.

The place of the blue cross in figure 4 additionally means the proposed strategy possesses elements of **developing a shared understanding,** whereas the second strategic objective focusing on policy solutions disseminated to stakeholders and **development of governance pathways**, as identification of multiple 'moving parts' within the BEI implementation process is present.

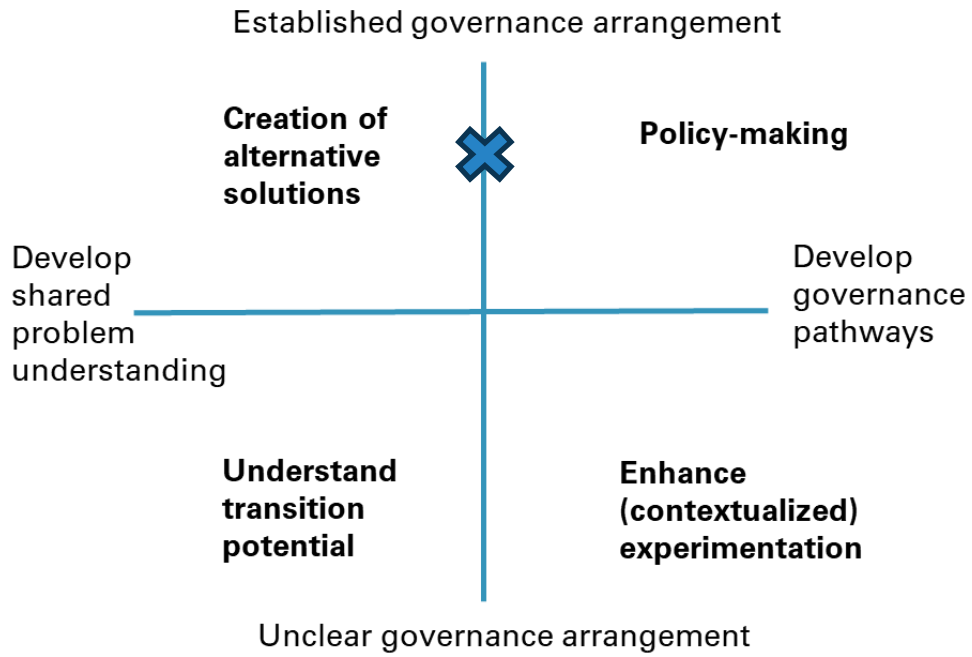


FIGURE 4 QUADRANT MATRIC DEPICTING DISTINCT TYPES OF GOVERNANCE STRATEGIES. THE BLUE CROSS MARKS THE RELEVANT STRATEGY TYPES FOR CASE 6, WHICH LIES BETWEEN CREATION OF ALTERNATIVE SOLUTIONS AND POLICYMAKING.

6.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

The solutions introduced in this report come with certain caveats which need to be considered. The EU has recently increased its focus on maladaptation, where poorly designed policy adaptation strategies can lead to unintended adverse outcomes of applied sustainable solutions[44].

[44] van Minnen, J. *et al.* (2025) *Supporting successful adaptation and limiting maladaptation to climate change*. Technical Paper. European Network of the Heads of Environment Protection Agencies (EPA Network) - Interest Group Climate Change Adaptation. Available at: https://epanet.eea.europa.eu/reports-letters/technical-paper-on-maladaptation_epa-interest-group-climate-change-adaptation_final_30-06-2025.pdf

As an example, Figure 5 provides an overview of pitfalls appearing when introducing the CfD as a solution to the lack of industry engagement in OWP development:

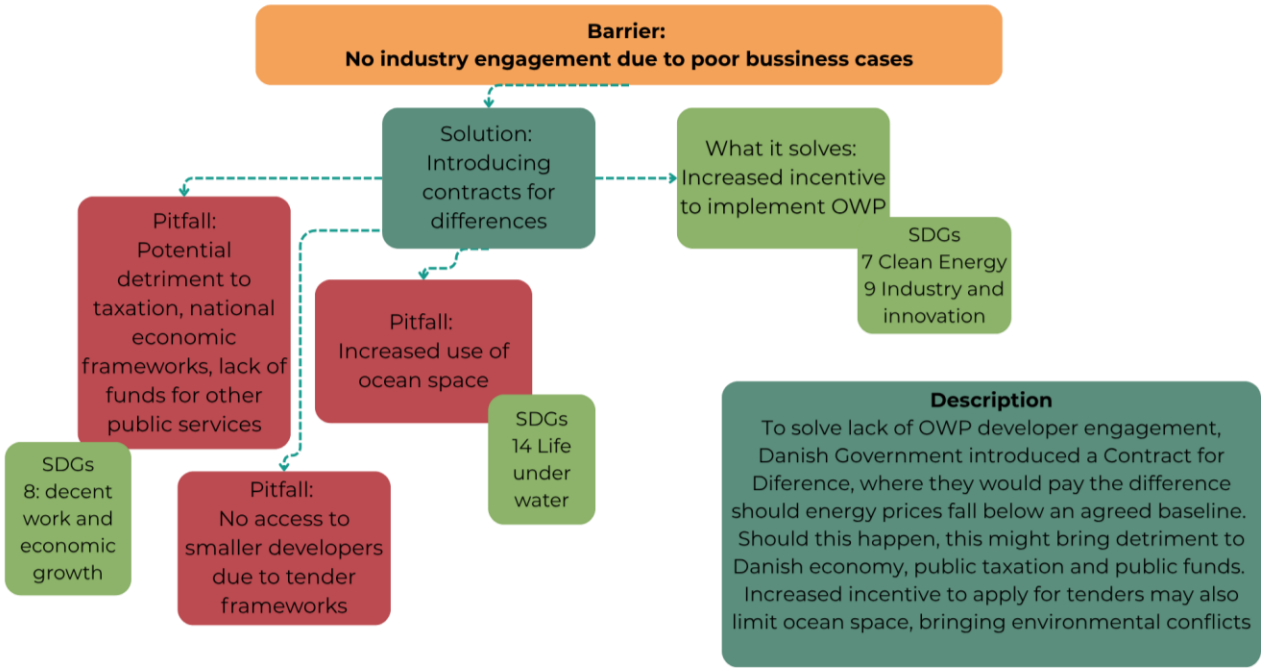


FIGURE 5 EXAMPLE OF PITFALLS IN INTRODUCED POLICY SOLUTION. THIS FIGURE FOCUSES ON INTRODUCING CFDS TO SOLVE AN ECONOMIC RISK BARRIER, EACH PITFALL CONTRADICTING OTHER SUSTAINABLE DEVELOPMENT GOALS.

While the CfD solves an immediate problem in economic incentives to engage with OWP development, it risks detriment to taxation, national economic frameworks and removes fund from other potential beneficial social/public services, which contradicts SDG 8 in Decent work and economic growth. The increased deployment moreover puts pressure on ocean spaces, while allocated for RE-development still has environmental impacts to be considered, which conflicts with SDG 14 Life Under Water.

The same line of thought can be applied for other policy solutions in the BEI case (Figure 6)

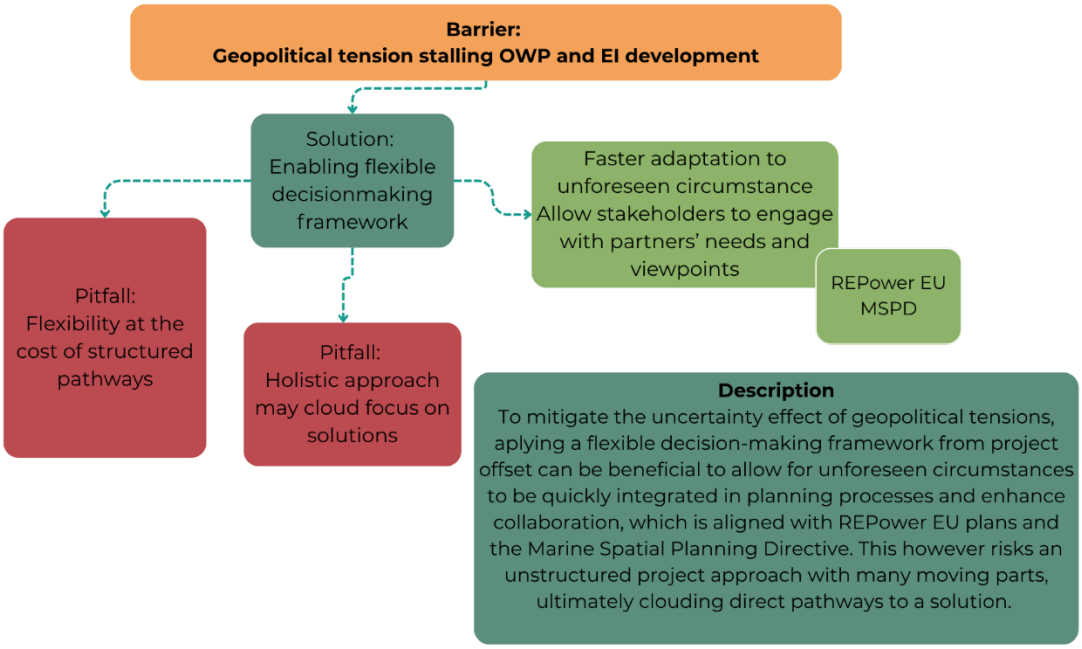


FIGURE 6 EXAMPLE OF PITFALLS IN INTRODUCED POLICY SOLUTION. THIS FIGURE FOCUSES ON ENABLING A FLEXIBLE DECISION-MAKING FRAMEWORK TO MITIGATE UNCERTAINTY ARISING FROM GEOPOLITICAL TENSIONS.

In this way, an integrated policy solution may unintentionally cause detriment in otherwise unrelated, or only loosely related, fields. Political risks from implementation, then, are that these pitfalls are not foreseen and thus renders the applied solution either ineffective, or effective, though with other issues arising. This has potential to consume further resources to manage newly arising issues, potentially more issues than the one issue the solutions thought to solve. For this reason, the holistic overview and involvement of various perspectives in planning processes, while time consuming, is necessary.

6.4. REFLECTIONS ON THE METHODOLOGY

While the workshop approach was beneficial in validating research direction and preliminary results and providing input to the ideation and prototyping phases, there were limitations based on stakeholder fatigue of relevant institutions.

If, on one side, participation of the ones attending was very satisfactory, several challenges appeared during planning. The number of registered participants (both online and in person) was quite different compared to the actual participation, with 40 people registered yet only 14 being present. The positive aspect was that more time was available for in-group discussions, but the negative was that several points of view were lost. Furthermore, when planning the questions and activities were targeted specific stakeholder types, not all of which were represented at turn-out. For this reason, questions posed may not have been as fit for purpose to the group discussions.

Another point which could be improved is the time dedicated to the discussions, as an hour for each roundtable (policy, economic and social) was not sufficient. This was partly due to the engagement of the participants, but also a tendency of certain stakeholders to dominate the conversation, needing moderators to frequently intervene. More time would give stakeholders with less engagement a chance to share their viewpoints. In general, while the initial presentations provided an excellent introduction to the day's theme in *The Future of Offshore Wind*, a different time schedule with potential rotation of table discussions would have provided further insights. Still, the insights gained from the workshop still provided excellent direction for the governance strategy prototype, where a combination of a full, holistic overview of the BEI and a structured direction for future planning was needed.

Figure 7 provides an overview of the process in PERMAGOV towards design of the governance strategy in Case 6. The MLCMG model work provided an overview of relevant governance arrangement from which the case study teams' initial reflections could be compared with stakeholder's viewpoints and needs. Questions such as 'who is involved' directed which stakeholders to be invited to provide feedback, which allowed us to identify specific actions needed, finally advising the focus of the governance strategy.

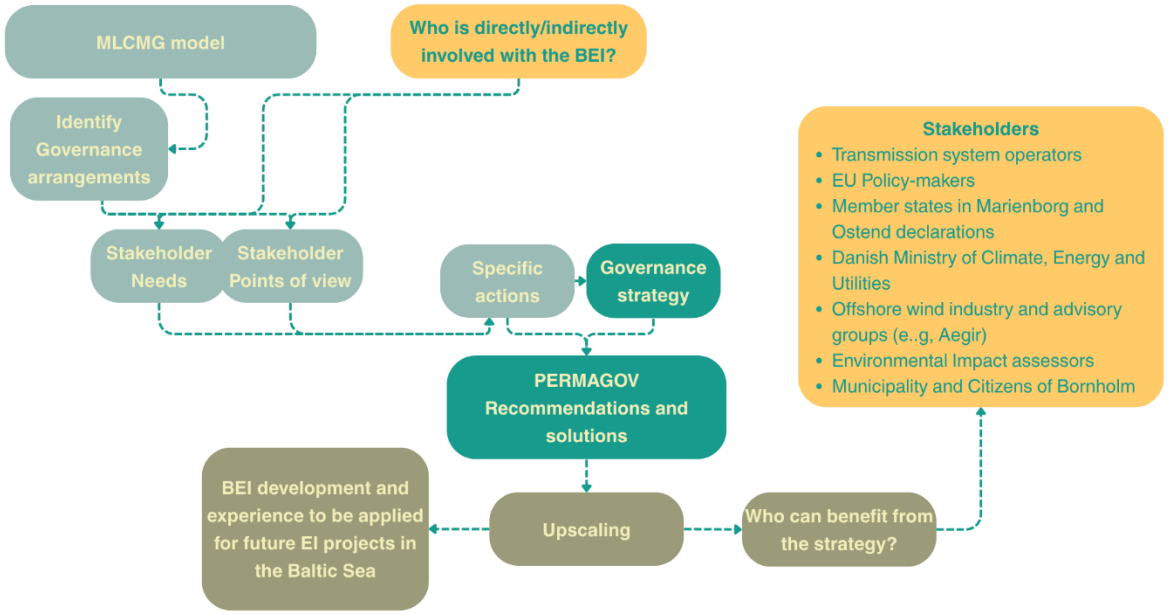


FIGURE 7 OVERVIEW OF PERMAGOV APPROACH IN DESIGNING GOVERNANCE STRATEGY

At the end of the figure lies upscaling, where it should be considered if the proposed solution can apply to a larger scale. Case 6 finds that this can be done. The strategic objectives mentioned can be transferred to other Baltic countries expecting to deploy EIs in the future, as the BEI case

exists as a pilot project for inland hub infrastructure [45]. If a structured and modular plan can be established, and an overview of all components within the project be provided, experiences in this project should be easily transferable. This, especially considering the proposed framework, should be flexible, so that differentiating circumstances in e.g., planning roadblocks or a shifting geopolitical situation can be quickly integrated and managed.

[45] Sun Cole Seeberg Dyremose and others, 'Enabling Change and Innovation in Marine Governance: Lessons Learnt from the Danish Bornholm Energy Island', *Maritime Studies*, 25.2 (2026), p. 32, doi:10.1007/s40152-026-00490-z.

7. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 7: DEVELOPMENT OF OFFSHORE WIND ENERGY IN NORWAY

Authors:
Jannike Falk-Andersson, UiT the Arctic University of Norway

7.1. SHORT CASE DESCRIPTION

This case study focuses on the processes that form the basis for the opening of areas for offshore ocean wind production in general, and to get licenses to establish specific ocean wind projects within these areas. Since the EGD emission targets was set, the Norwegian government has put an increased focus on accelerating renewable energy. The objective is to, by 2040, allocate areas for offshore wind development that corresponds to a production capacity of 30 GW wind power. Key policies relevant for ocean wind development include to secure long-term value creation of Norwegian energy resources (Energy for Work[46]), reduce climate emissions (EDG and Norway's climate action plan[47]) and, to meet multiple objectives. The latter involves finding solutions that can secure coexistence between different users of ocean space, including environmental values[48,49].

The problem statement in the form of a Point of View (POV) chosen as a starting point for ideation was securing good coexistence with the fisheries and marine nature in allocating areas for ocean wind. This is a governance challenge that all key actors agree on, although their motivation differ somewhat (see D6.1 for details). After feedback from the stakeholders that coexistence with nature was the most important challenge, the POV chosen was "All actors need good coexistence between ocean wind and nature because this is a prerequisite to secure the political support for the subsidies the ocean wind industry needs to realize their projects". When re-writing this to represent the future vision, fisheries stakeholders stressed that they were concerned about the indirect impact of ocean wind on fisheries production. The future vision used as a starting point for ideation of solutions in the workshops implemented was therefore the following:

Imagine you are in year 2040. Ocean wind projects have been allocated sufficient areas to produce 30 GW. Now that there is broad support for the subsidies needed to handle the technical challenges, ocean wind can become an important part of the Norwegian, green energy mix.

There have been ***no major conflicts related to coexistence between ocean wind and nature*** *in allocation of areas and licences for ocean wind, and the importance of ensuring nature to secure production of seafood is recognized.*

7.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 7

Two workshops were held to get input on actions and sequencing of actions to achieve the future vision. The first workshop was held in Honningsvåg, 11th of November 2025, with 7 stakeholders

[46] Ministry of Petroleum and Energy (2021). White Paper Nr. 36 (2020-2021) Energi til arbeid – langsiktig verdiskaping fra norske energiressurser. Oslo, Norway
[47] Ministry of Climate and Environment (2021). White Paper Nr. 13 (2020-2021) Norway's Climate Action Plan for 2021-2030. Oslo, Norway
[48] Knol-Kauffman, M., Nielsen, K. N., Sander, G., & Arbo, P. (2023). Sustainability conflicts in the blue economy: planning for offshore aquaculture and offshore wind energy development in Norway. Maritime Studies, 22(4), 47. Sameksistens - regjeringen.no
[49] Ministry of Climate and Environment (2020). White Paper Nr. 20 (2019-2020). Norway's integrated ocean management plans — Barents Sea–Lofoten area; the Norwegian Sea; and the North Sea and Skagerrak. Oslo, Norway

representing the ocean wind and energy industry, municipal management, the educational sector, marine research and local industry development interest organisations. The second workshop was held in Oslo, 2nd of November 2025, with 9 stakeholders representing the ocean wind and energy industry, environmental NGOs and the Directorate of Fisheries. The workshop participants in Honningsvåg formed 2 groups, while the one in Oslo formed 3 groups, giving in total 5 results from the back-casting exercise. Prior to the workshop all participants had been provided with a summary of the results from the empathy phase of the project, which included the following 7 identified needs connected to the identified POV.

1. That good coexistence with nature is ensured alongside offshore wind development by implementing new knowledge about environmental consequences along the way.
2. That sufficient time is taken to gather knowledge about environmental consequences and nature values.
3. That it becomes clearer what role the coexistence Group (established by the Ministry of Energy) will have in the administration's work to ensure good coexistence between offshore wind and nature.
4. That the Norwegian Environmental Agency is able to do a good job in the administration's work to ensure good coexistence between offshore wind and nature.
5. That the administration ensures increased transparency in balancing different values in decisions regarding the allocation of areas and licenses for offshore wind.
6. That the consequences of offshore wind development on nature are assessed in relation to the impact from other industries and the scale of offshore wind development.
7. To define what good coexistence between offshore wind and nature means in practice.

The workshop consisted of two sections: a main section before lunch (3 hours), and an optional section after lunch (up to 2 hours) to allow participants that had the opportunity to contribute more to elaborate on the outcomes of the main section. The main section started with an introduction to Permagov, the four identified governance areas (the Permagov MLCMG model), the Norwegian case and how the participant’s input would be treated in terms of the General Data Protection Regulation. Then the future vision was presented before we showed the goal of the workshop, which was to make a line of actions from today until 2040 to achieve the future vision. The participants were then divided into groups.

The workshop participants were then asked if there was any need to supplement the 7 identified needs connected to the POV identified, which none of the participants found necessary, before they were asked to rank the needs. They had to reach agreement on the ranking according to whether the needs were “less important” to “very important” in achieving the future vision. They were also asked to identify if any of the needs were dependent of each other and make an arrow indicating this. They were asked to take any needs that were connected to the most important need and turn that into an action in the next step. The starting point for the next step was the need chosen as the most important. Some groups decided to have more than one need as most important.

In the next step, they were asked to first independently identify actions that could be taken to achieve the future vision. The respondents got 8 minutes to come up with “quick fix” actions and

write each idea on a sticky note. They then got another 8 minutes to come up with “crazy ideas” where they had no limits on the ability to implement the actions (e.g. endless resources, AI works perfectly). They then worked in the groups and presented the ideas of actions to each other and grouped similar ideas of actions, before they chose the best ideas of actions and filled in action cards describing 1) the action, 2) How the action was carried out, and 3) Who carried out the action. At this stage they got an overview of the actors of the MGA identified in D4.2 to give some ideas as to who could carry out the action.

They were then asked to organize the actions according to the sequence in which they had to be carried out, put arrows between the actions, and supply with further actions if needed by filling out further action cards. Finally, the groups were asked to evaluate if the actors that must implement the actions have the capability to do so. A note saying “YES” was placed where the actors were believed to have this capability. In cases where they did not have this capability, they had to note which capabilities had to be strengthen, and the likelihood of the actor to be able to do so (high-moderate-low), and why. Then they were invited to identify further actions that could strengthen actor capability, or actions that could allow for the system to “work around” the lack of capability of actors to implement actions. Few of the groups had the capacity to evaluate capabilities. None of the groups rated actor capabilities and identified actions to strengthen actor capability.

All five groups ranked Need 1 highly, while four of the groups ranked Need 2 highly. For the group that did not rank Need 2 highly, this was identified as a need that contributed to Need 1. Two of the groups identified a connection between Needs 1 and 2. This reflects the groups' belief that these two needs can and should be addressed in parallel and in dialogue with each other.

The five sets of actions proposed by the groups were analysed together, and similar themes were grouped together. Several of the themes in the proposed measures were recurring across the different groups (the number of groups that proposed measures under these themes is shown in parentheses):

1. **Establishing a shared understanding and acceptance** of the energy needs from offshore wind (3 out of 5 groups).
2. This measure, in combination with measures 3 and 4, will contribute to **increased predictability in the regulatory framework conditions** for the industry. To further enhance predictability, the following measures were proposed: 1) A timeline for licensing processes (2 out of 5), 2) Clear cost distribution for knowledge acquisition (2 out of 5), and 3) Qualification requirements for industry and R&D actors (1 out of 5).
3. **A system for identifying knowledge needs and generating new knowledge**, consisting of measures for: 1) Learning through small-scale development (2 out of 5), 2) Long-term funding for monitoring and addressing knowledge gaps (5 out of 5), 3) Holistic planning (4 out of 5), and 4) A system for the continuous integration of new knowledge (4 out of 5).
4. **Coexistence and legitimacy**, consisting of measures for: 1) improved Transparency in decisions through development of clear decision criteria for area allocation (3 out of 5), and 2) A process to ensure legitimacy for controversial decisions (3 out of 5). All groups stressed the need for good inclusion of stakeholders including; 3) Proper inclusion of

stakeholders (2 out of 5), 4) two-way dialogue between the coexistence group and ED (2 out of 5), and 5) A manual for coexistence between ocean wind and nature (2 out of 5).

A prototype in the form of a report was developed describing the four types of measures, and 10 sub-measures, and listing the action cards associated with these measures (see Appendix 1 for details). This was sent out to workshop participants prior to the testing of the solutions. One 2-hour digital workshop was held with representatives from ENGO (1), the ocean wind industry (2) and research/ consultancy related to ocean wind (2). One online one-to-one interview was held with a representative from the ocean wind industry and a representative from the fishing industry commented on a draft of this document. The data from the digital workshop and the interview/ written input was pooled to represent stakeholder input. One 3-hour physical workshop was held with four researchers: covering the areas resource economics, sustainable business development, ocean governance, and international relations. The stakeholders and researchers were asked for each measure if 1) any measures were missing, 2) if they disagreed with the proposed measure or believed it had to be adjusted, 3) if the actors have the capacity to implement the measure, 4) if there were any challenges associated with the measure, 5) if the measure was in conflict with the UN Sustainability Development Goals (SDGs) and if so, why, and 6) other input. In the digital meetings the 10 tables representing the sub-measures were administered using Miro, while large print-outs of the tables and post-it notes were used in the physical workshop. Participants noted down their input where they had something they wanted to give feedback on. The final policy recommendations were based on an analysis of the input on the proposed measures.

7.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

7.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

Improvements in the governance strategies was recommended for the four thematic areas identified in the workshops, which were: 1) Establishing a shared understanding and acceptance of the energy needs from offshore wind, 2) Predictable regulatory framework conditions, 3) A system for identifying knowledge needs and knowledge generation and 4) Coexistence and legitimacy (Figure 4). Note that there were no discussions as to whether all the stakeholders/researchers agreed with the feedback. The input was given individually by the stakeholders, while it was based on common discussions among the researchers. In general, the stakeholders had few inputs on the impact of the proposed measures on the SDGs. However, this could be due to time constraints (2- vs 3-hour workshop) and that the SDGs had a stronger focus in the workshop with the scientists.

Figure 4 illustrates how the four thematic areas feed into each other, with the circle in the middle of the sub-measures in thematic area 3 illustrating an interconnected system for identifying knowledge needs and generating new knowledge to support an adaptive decision making system. In the following sections, the proposed measures to solutions under each thematic area will be presented and the input on these solutions will be described. An overview of the proposed measures and their numbering as referred to in the text, how they should be implemented and by whom can be found in Appendix 1.

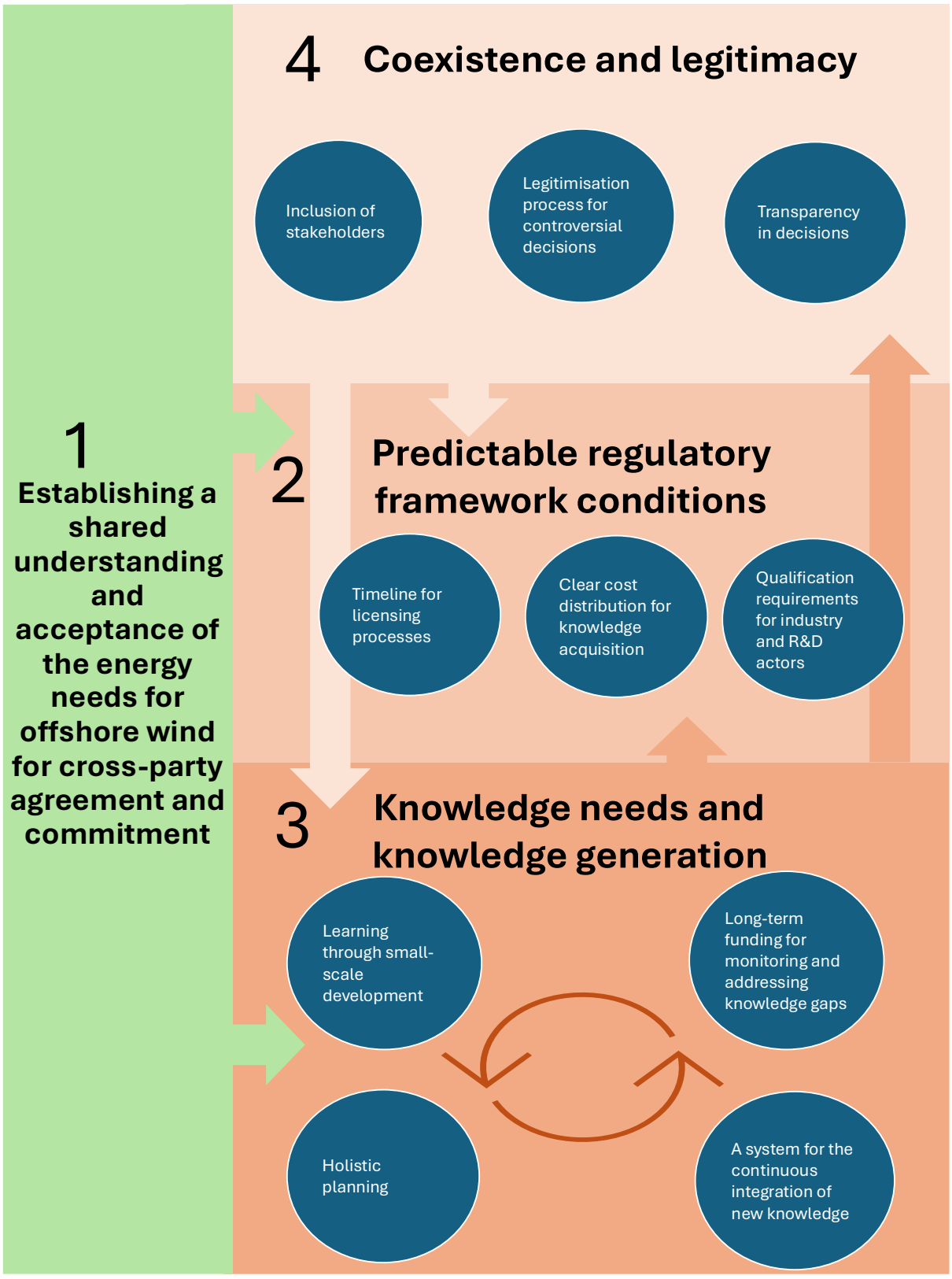


FIGURE 4 THE FOUR THEMATIC AREAS OF IMPROVEMENT AS IDENTIFIED THROUGH STAKEHOLDER WORKSHOPS

Establishing a shared understanding and acceptance of the energy needs from offshore wind

The first proposed measure is a process that creates shared understanding and knowledge, leading to public acceptance of offshore wind. This forms the basis for cross-political agreement on long-term commitments to offshore wind goals. This provides predictability for implementing the offshore wind objectives.

Inputs on measure 1.1, Dialogue meetings for local anchoring of energy needs, include that local municipalities may not have the capability to carry out dialogue meetings to secure local anchoring of energy needs. There is a need to leverage on knowledge across directorates in this process. There is a concern of power-imbalances in the dialogue process, and that minority voices are not heard. It is important that the choices made based on the dialogue process are well-documented. It was stressed that the dialogue must be solution-oriented and knowledge-based. Local anchoring is key, also to secure that the locals gain something, for example ownership. A need to lift the debate to have a broader discussion where all alternatives are discussed, both in terms of alternative energy sources, prioritisation of energy, and potential for energy efficiency improvements, and what future we as a society would like to see, was also pointed out. The energy needs must be scrutinised; in terms of how much, where, to whom, and at what costs both in monetary terms and other consequences. There is a need for an overarching facts-based political discussion on this. These discussions will involve a prioritisation between industries and interests. It is important that it is clarified who should make these priorities, and which processes and requirements for inclusion should be in place to secure legitimacy of these decisions.

It was noted that any solution will result in a conflict with the different SDGs, thus there is a need to prioritise. On the other hand, some stakeholders believed that if correctly implemented, the solutions may not compromise the different SDGs. Key challenges of implementation as identified by the stakeholders was that the debate on nuclear power muddles the discussion on energy needs, and that the climate change debate is losing under the current geopolitical situation where energy security is prioritized over the need for renewable energy. While the stakeholders on the topic of missing measures emphasized the need for educating people on why ocean wind is necessary, the difference between land-based and ocean-based wind, and future energy needs, the experts focused on securing local incentives, proper monitoring of the dialogue process, and local ownership.

An energy needs agreement where the goal is reduced from 30 to 15 GW offshore wind (measure 1.2) may not meet Norway's future energy need. Neither will it meet the energy needs of Europe, which part of the offshore wind ambitions are linked to. The energy needs agreement should also be coupled with holistic planning to secure coexistence with nature. The stakeholders disagree with respect to whether marine spatial planning is the appropriate tool for this. The researchers pointed out that it is difficult to secure cross-political agreement on framework conditions for ocean wind (1.3), while the stakeholders emphasized the importance of securing this despite the current challenges related to shifting political commitments and framework conditions.

Increased predictability in the regulatory framework conditions

Cross-political agreement to commit to the offshore wind goals, in combination with action groups 3 on Knowledge needs and knowledge generation and 4 on Coexistence and legitimacy, is important for securing predictability of the framework conditions for the industry. Input on setting a timeline for licensing processes (2.1) includes that one should use insight from other countries that does many of the licensing processes in parallel, that the environmental authorities should be included and that they should also be included in decision on the timeline, and that there should be clear deadlines for the government procedures. The timeline should also account for pre-assessments of the environment, which will be central in determining how long time the licensing process will take. Regarding capacity, there is a lack of resources and knowledge in both the directorates and the Institute of Marine Research to finalise the regulations related to ocean wind. There was a concern that such a timeline would be in conflict with SDG 16 (Pease, justice and strong institutions) as it could result in the consultation process being of lower quality.

On the measure of A clear distribution of costs to address knowledge gaps (2.2), the importance of updating knowledge when we get better monitoring technology and knowledge was stressed to secure SDG 14 (Life below water). It was also pointed out that state-paid environmental mapping is a subsidy. Implementation of qualification requirements for the offshore wind industry and R&D actors (2.3) should be adaptive as we get more knowledge, while also balancing the need for predictability. The adaptability is important to secure responsible research and innovation (SDG9, Industry, innovation and infrastructure) and adjust the requirement for new knowledge with new insight to secure SDG 14.

A system for identifying knowledge needs and generating new knowledge

A series of measures that produce new knowledge and identify knowledge needs were proposed to support an adaptive decision-making system. These provide input to one another to prioritize knowledge gaps to be filled and ensure sound decisions regarding the allocation of areas and licenses for offshore wind based on the best available knowledge, as well as to reduce the negative impact of offshore wind on the environment. There were four themes of measures related to knowledge generation and identifying knowledge needs.

Knowledge generation trough small-scale projects prior to up-scaling

On measure Learning through smaller demonstration projects paid for by the petroleum tax regime (3.1.1), the need for measures that secures knowledge sharing (for example that it is a requirement) was stressed. There were concerns that the Ministry of Finance will never allow such ear-marking of funding in the national budget, that this is a subsidy to one specific industry, and that less comprehensive licensing processes could be in conflict with SDG 16 (Peace, justice and strong institutions) on fairness and environmental requirements (SDG 14). Insight into consequences of upscaling for nature may be limited as the test projects only affect a small spatial area. Knowledge exchange between international test projects (3.1.2), could be challenged by a lack of incentives to share knowledge as knowledge gives a competitive advantage. Futhermore, competition promotes innovation. There is a need to involve actors from the entire Norwegian

innovation system, and the Nordic countries, in implementation of measure 3.1.2. It was questioned if Norway should be the one carrying the cost of developing new offshore wind technology. It is important that the test projects are relevant for local conditions. A sustainability concern was that the test projects should be fairly distributed globally, also in developing countries.

In terms of Sharing knowledge from demonstration projects (3.1.4), Wind Europe was seen as a useful portal, and a requirement can be set in cooperation with EU that relevant data must be shared when allocated a license and funding for the demonstration project. Risks to SDG 16 was identified in terms of who secures that all information is shared, and SDG 9 (Industry, innovation and infrastructure) as carrying out demonstration projects gives a competitive advantage.

Long-term funding for monitoring and addressing knowledge gaps

On Identification of knowledge needs (3.2.1) some of the stakeholders said that this had already been done through the strategic impact assessments where the knowledge gaps are identified, while others said these were based on existing knowledge that is limited by large knowledge gaps. Thus there is a need to fill these gaps before making decisions on where to place ocean wind farms. While the strategic impact assessments is a good starting point, those conducting them had limited resources and since they were conducted the needs for knowledge has changed. It is important that a responsible agent for updating these assessments are identified, and that it is agreed how this should be done, by whom and at what interval. While a lot is done on data collection and identification of knowledge gaps, little is done to define what is acceptable impact. The Best Available Technology principle, that requires operators to use the best available technologies and operation methods to minimize environmental impact, could be used to define what is acceptable and how many measures should be implemented. The need for the Environmental authorities to get a larger role, mandate and enough resources to identify knowledge needs was stressed.

On the measure to implement a Long-term and comprehensive plan to address knowledge gaps (3.2.2), stakeholders pointed to the need for input from researchers to identify these, and stronger involvement of environmental authorities. There is also a need to secure long-term financing that secures predictability in planning of biodiversity mapping and research. Furthermore, the plan should support holistic planning of Norwegian sea areas. There was disagreement if this should involve marine area planning. In implementation of a Long-term research program to address knowledge gaps (3.2.3), it is important to secure alignment between the different research programs.

Also, with respect to a Long-term plan for nature mapping to gather knowledge before opening areas to ocean wind (3.2.4), the Environmental authorities (NEA) should be more involved and given the mandate and resources to contribute. Furthermore, financing for nature mapping should be long-term (5-10 years). Also here, the plan should support holistic marine planning of Norwegian sea areas.

Strengthening of the international dialogue, particularly with countries adjacent to Norway, was seen as important in Sharing knowledge from research and monitoring (3.2.5). While knowledge sharing was seen as being implemented already in many cases (e.g. environmental monitoring data), sharing of data from commercial actors could be improved. It is also important to share

knowledge immediately, as publication can take a long time. In Updated knowledge needs (3.2.6), it is seen as important to also get knowledge from other countries. However, one must be aware that data from other countries are not necessarily directly applicable to Norwegian conditions, nor the other way around.

Holistic planning

There were concerns that all the measures suggested under holistic planning would require a lot of resources and negatively affect SDG8 (Decent work and economic growth) on economic growth. On the measure of developing a Comprehensive marine spatial plan (3.3.1) it was noted that there must be a budget for this and that it is important to have a broad range of stakeholders involved in the process. There were also concerns that it would in practice be difficult to secure a good process. Not all stakeholders agreed that marine spatial planning is the appropriate tool for holistic management. Experience from other European countries with marine spatial planning has shown that this can have negative impacts on the fisheries. Compared to other ocean-based industries, the fishing industry and other food-producing areas have insufficient legal protection faced with emerging industries and marine conservation. The fisheries were concerned that marine spatial plans will not provide greater security for stable and predictable fisheries operations, but rather the opposite.

In terms of Development of a system for assessing cumulative impacts (3.3.2), NEA should be more heavily involved, as well as the Directorate of the Continental Shelf. Implementation of the system would also depend on the ambitions. There were also ethical and methodological concerns as such a system would involve comparison of incomparable values, the methods are still immature, and compensation measures are controversial. Furthermore, nature is dynamic and the oceans change continuously. In addition, climate change is a major force acting upon the oceans and associated fisheries. Another key concern is determining who should decide which values deserve greater weight. To secure SDG 16, it is important that all relevant stakeholders are included in the consultation processes. Also with respect to developing a Comprehensive plan for offshore wind development (3.3.3) based on the model for cumulative impacts, the fundamental ethical and methodological challenges related to indicators and comparison of different values, was raised. The measure Updated knowledge needs (3.3.4) did not get any comments.

A system for the continuous integration of new knowledge

In order to implement a System for incorporating new knowledge into the decision-making process regarding the allocation of areas and licenses for offshore wind (3.4.1), there is a need to develop a standard system for this. Knowledge from other countries should be used in development of this. However, stakeholders are concerned that NVE (The Norwegian Water Resources and Energy Directorate) does not have the capacity to develop and implement such a system. A Platform for sharing knowledge and data (3.4.2) should be harmonized to secure standardization of data. The researchers questioned the need for such a platform, as data is widely shared today through open-access platforms.

With respect to Sharing of data collected by the wind industry (3.4.3) and Sharing of data collected by the offshore wind industry (3.4.3) this should be requirements and not sharing data should have consequences. However, as under funding of demonstration projects, the issues of conflicts of interest and competitive advantage were pointed to.

Coexistence and legitimacy

It was stressed that is important that nature and fisheries, whose prosperity is intimately linked to nature, are taken into account and safeguarded in decision-making on area allocation for power production. In practice, this means that impacts on nature and fisheries are not only assessed, but that these assessments have consequences for whether areas are used for energy production. This can be secured through Developing decision criteria for the allocation of areas and licenses for offshore wind (4.1.1) that define minimum standards for environmental impact. In this process, the Ministry of Trade, Industry and Fishery should also be included. Environmental authorities must be secured enough resources and the mandate to contribute to the development and implementation of the decision criteria. A challenge with the measure is that the Ministry of Energy has not given high enough priority to nature, despite decisions by the Parliament that development of ocean wind should happen with a very low or positive environmental footprint. The mitigation hierarchy should be applied to handle and reduce negative impacts on nature, mitigation measures should be clearly defined, and mechanisms should be in place to secure that these are binding. Criteria for sustainability and nature should be coordinated with EU guidelines. Finally, there is a need for well-defined minimum criteria for prequalification and competition criteria, in line with EU's recommendations.

In establishment of an Independent mediator in case of dissent (4.1.2), the Ministry of Climate and Environment should be included. It was stressed that such a mediator should not have political bindings. Within today's framework, the actors pointed to for implementation (Ministry of Energy and the government) were not believed to have the capability to implement this measure. The need for this measure would also be reduced if there were clear criteria for which areas ocean wind should not be built. A concern of this measure and improving the processes for Participation in decision-making (4.1.3) is conflict with CBD 8, economic growth as these processes would take time. For measure 4.1.3 it was noted that cable landfall from ocean wind has had little focus in the impact assessments. Local authorities (municipalities and counties) should be represented to secure social acceptance, as well as research institutions.

A Two-way dialogue between the coexistence group and the Ministry of Energy (4.1.4) should include regular meetings, and a mandate should be given to the coexistence group to secure that new knowledge is integrated in the processes at the Ministry of Energy. There is a need for the Ministry to give priority to this and secure resources, as well as make clear timelines for the work.

In Creating a "manual" for nature and the environment (4.1.5), Denmark (Energistyrelsen) have made such manuals that can be used as a starting point. The actors involved need resources to secure the quality of such a manual. It is important that the manual lists principles for how nature should be taken into account and are clear about mandatory requirements to protect nature (e.g. red-listed species). It is important that the manual is fair (SDG 16).

7.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

The proposed solutions require innovations and changes to the following components of the MLCMG model (see D4.2 for details of model components) of the governance arrangement to improve its performance in achieving set targets:

Institutional barriers

To secure environmental values in decisions on allocation of areas for ocean wind, there is a need to strengthen the Environmental Authorities in terms of their mandate and resources. This would strengthen the **control this actor** would have over the outcomes of decisions regarding nature. There is also a need to strengthen the **actor control** of local stakeholders and minority voices by securing resources and competence of authorities at local to national level. **Actor accountability** would be improved through development of clear criteria for decision making and transparency in how stakeholder input is used, and establishment of a process for re-evaluation and cross-departmental discussions of controversial decision would serve as a mechanism for **resolving conflicts**. An adaptive decision-making system continuously integrating and applying state-of the art knowledge, would require a strengthening in the **development and use of knowledge**, including strong processes for reflexivity and institutional learning, appropriate science-policy interfaces, strong inclusion of a diversity of knowledge providers and requirements to share data open-access.

Collaborative dynamics

Establishing a shared understanding an acceptance of the energy needs for offshore wind involves a process to agree on a collective goal. Factors that must be secured related to **principled engagement** includes that communication must be fair and open, and informed by multiple viewpoints and values. This **shared motivation** would be the basis for implementing the other components of the proposed solutions. The solutions proposed involves the entire system of actors and will rely on the **capacity for joint action** of the governance arrangement, but with governmental agencies having to play key leadership roles and a political will to secure funding and other appropriate framework conditions.

Governance capabilities

An adaptive governance solution requires a strengthening of key actor's governance capabilities, particularly with respect to **reflexivity, agility and revitalization**. Given the key role of governmental agencies in implementation of these solutions, they would be the main targets for building this type of competence within the institutions.

E-governance

While the need for an open-access data sharing platform was mentioned as part of the solution, many of these platforms already exists and are in active use. However, there is a need to

investigate if cross-border sharing of information generated by industry actors can be supported by currently available platforms.

7.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

A central element of the solutions proposed, is to first *develop a shared problem understanding* from local to national level. The framing of this process would determine if the discussions will take place within a transformative change setting. This project, and thereby the system of solutions, was not framed within transformative change setting. Thus, the solution assumes that the shared problem understanding will result in support for ocean wind development. The solutions are related to the established governance arrangement and how they interact in identifying areas and granting licences to ocean wind, while securing nature values. Many of the solutions aim at policy-making, but they generally need still to mature.

7.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

Details on risk to sustainability can be found in section 3.1 where feedback on the proposed measures are reported. In summary, across the four areas of proposed governance improvements, there is a need to strengthen environmental authorities both with respect to their mandate and resources. Norway should also learn from other countries' experiences in implementing measures to strengthen ocean governance in the context of securing nature while developing offshore wind. While the proposed measures were quite comprehensive, it was also stressed that we should build on what we have (e.g. existing management and industry plans, and existing analysis of knowledge status and knowledge gaps).

Key concerns for proposed measures in governance area 1 are power-imbalances and that minority voices won't be heard in a consultation process that aims at achieving a local-to-national, cross-party agreement and commitment to offshore wind ambitions. Municipalities may not have the capacity to secure a good consultation process at the local level. Furthermore, the problem was not framed in a transformative change setting, which would allow to discuss alternative futures, thereby limiting the dialogue process. On securing predictable regulatory framework conditions (area 2), there was a concern that a set timeline could reduce the quality of the consultation process.

Concerns related to measures proposed for governance area 3 on knowledge needs and knowledge generation, included that implementation of such a comprehensive system would be in conflict with economic growth as it would require both time and resources. Allowing less comprehensive licensing processes in implementation of small-scale learning projects, risks compromising nature. Open sharing of knowledge would also be in conflict with the competitive advantage of industry partners implementing such projects. The proposed funding model would also result in the state favouring one industry. There were concerns that key actors do not have the capability to secure good stakeholder involvement in the process of holistic planning of ocean space. Furthermore, there are methodological and ethical concerns related to comparing

incomparable values in such holistic assessment schemes. Finally, there was a concern that key actors do not have the capacity to implement the proposed adaptive decision-making system.

For governance area 4, to strengthen coexistence and legitimacy, improving transparency in decisions through clear decision criteria should include mechanisms to secure that these are binding. The actors identified as those that should be responsible for implementing a legitimization process for controversial decisions, were not believed to have this capability.

7.4. UPSCALING

All the case studies in the Permagov project have addressed how to improve EU marine governance to better meet the goals set in the European Green Deal on cutting greenhouse gas emissions. Development of a shared understanding of the problem is key to working together in developing and implementing solutions to this challenge, while also securing other policy goals. However, as also underlined by both the Intergovernmental Panel on Climate Change (IPCC)[50] and The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)[51], goals for conserving nature and securing a just transition can only be achieved through transformative changes across economic, social, political and technological factors. Thus, discussions on the green transition should take place in a transformative change setting.

The Norwegian stakeholders emphasised the need to reduce the offshore wind ambitions to to reduce conflict with other users, particularly fisheries, and nature. Evaluating the need for reducing green energy ambitions to reduce conflict levels, could also be relevant in other European contexts. In this context, re-framing the challenge to include multiple policy goals, could enable a solution pathway that promotes coexistence between different users and values.

Being able to meet multiple policy goals while reducing greenhouse gas emissions require adaptive, transparent, and inclusive decision-making systems. Important elements in such systems are enough resources and competence to properly include stakeholders, transparency in how knowledge is used, development of clear evaluation criteria, holistic marine management procedures, sufficient and long-term resources to secure knowledge production, and requirements for open-access sharing of data also from the industry.

These measures would support the following priorities of the Ocean Pact: protecting and restoring ocean health (re-framing the challenge to meet multiple objectives and identify transformative solutions), supporting coastal and island communities (through better stakeholder involvement) advancing ocean research, knowledge, skills and innovation (adaptive, transparent and inclusive decision-making).

[50] IPCC_AR6_SYR_SPM.pdf
[51] Summary for policymakers of the global assessment report on biodiversity and ecosystem services | Zenodo

7.5. REFLECTIONS ON THE METHODOLOGY

The process guidance allowed enough flexibility to adjust the methods to the case study and stakeholder availability. However, combining identification of solutions with insights on the governance capability of actors to implement the action was not possible due to a lack of time stakeholders could participate in the innovation process and the high number of actions and associated actors identified in the system of solutions. Thus, while the backcasting allowed for the identification of the range of actions needed to reach the end goal, it also resulted in a high number of actions to be assessed. To properly evaluate the sustainability challenges of the proposed solutions and actor capabilities, more time is needed for input from a range of stakeholders and knowledge holders.

Appendix

Table listing the measures proposed to reach the future vision as identified by the workshop participants listing the title of the measure, how it should be implemented and by whom.

1 Establishing a shared understanding and acceptance of the need for offshore Wind
1.1: Local anchoring of energy needs How: Dialogue meetings where energy needs, climate consequences, jobs, and the impacts of interventions are presented and discussed Who: Municipalities and county councils, energy organizations, local businesses, and local interest organizations
1.2: "Energy needs agreement" with the goal of 15 GW offshore wind How: Input from local dialogue meetings, civil service, and experts form the basis for a long-term, broadly anchored agreement. Who: The Parliament
1.3: Cross-political agreement on framework conditions How: Energy needs agreement forms the basis for consensus on framework conditions for the offshore wind industry Who: The Parliament
Predictable framework conditions for the industry
2.1: Timeline for licensing processes How: The Ministry of Energy determines the timeline and instructs NVE Who: Ministry of Energy
2.2: Clear distribution of costs to address knowledge gaps How: The state is responsible for nature mapping and addressing general knowledge gaps. Developers are responsible for assessing project-specific environmental impacts. Who: The state and developers, where the developer granted the license pays for the collected data.

2.3: Implementation of qualification requirements How: Industry players in the offshore wind sector and R&D actors must qualify according to clear quality criteria to ensure they have the ability to meet the qualification standards. Who: Ministry of Energy
3 Knowledge needs and knowledge generation
3.1.1: Learning through smaller demonstration projects How: The Ministry of Energy grants permission for the development of demonstration projects funded through the petroleum tax regime Who: Offshore wind developers nationally
3.1.2: Exchange of experience between international test projects How: Regular meetings where experiences are shared, and solutions are discussed collectively Who: The Norwegian Embassy and Innovation Norway organize the meetings with participation from international offshore wind developers
3.1.3: Input on knowledge needs from demonstration projects How: Identification of knowledge needs to learn from demonstration projects before scaling up Who: Offshore wind developers nationally and internationally
3.1.4: Share knowledge from demonstration projects How: Publicly available reports in national and international databases Who: Offshore wind developers nationally and internationally
3.2.1: Identification of knowledge needs How: Strategic impact assessment of environmental and societal consequences related to offshore wind development, including knowledge gaps. Who: NVE (Norwegian Water Resources and Energy Directorate)
3.2.2: Long-term and comprehensive plan to address knowledge gaps How: NVE leads the development of the plan, with input from the civil service and experts Who: The Directorate of Energy, supported by NVE and the Research Council of Norway (NFR)
3.2.3: Long-term research program to address knowledge gaps How: Funding for research through the state budget over 10 years Who: Ministry of Energy with support from NFR
3.2.4: Long-term plan for nature mapping to gather knowledge before opening How: 5-year financing plans linked to licensing rounds Who: NVE with support from the Norwegian Environment Agency (NEA)

3.2.5: Share knowledge from research and monitoring How: Publicly available reports and data in national and international databases Who: R&D environments involved in research, nature mapping, and monitoring
3.2.6: Updated knowledge needs How: New knowledge provides input for updated impact assessments and knowledge requirements Who: NVE with input from R&D environments
3.3.1: Comprehensive marine spatial plan How: Interdepartmental plan with input from all stakeholders and expert communities, based on the industry plan for Norwegian marine areas and the integrated management plans. Who: Ministry of Climate and Environment (KLD) with input from all relevant authorities
3.3.2: Develop a system for assessing cumulative impacts How: Collaboration between multiple institutes and directorates to develop indicators based on the "risk map for the coast" model to assess the cumulative impacts of various stressors on the marine environment Who: NEA, with input from R&D environments and relevant directorates
3.3.3: Comprehensive plan for offshore wind development How: Use a model based on indicators for cumulative impacts to create a comprehensive plan for offshore wind development Who: Ministry of Energy, with input from R&D environments and relevant directorates
3.3.4: Updated knowledge needs How: Knowledge needs identified during the development of indicators for cumulative impacts provide input for updated impact assessments and knowledge requirements Who: NEA, with input from R&D environments and relevant directorates
3.4.1: System for incorporating new knowledge into decision-making processes regarding the allocation of areas and licenses for offshore wind How: Standardized system across knowledge holders for updating knowledge Who: NVE
3.4.2: Platform for sharing knowledge and data How: Open database Who: NVE and the offshore wind industry
3.4.3: Sharing of data collected by the offshore wind industry How: Government requirements for the offshore wind industry Who: The authorities
3.4.4: Sharing of data between countries How: International agreements based on existing agreements and cooperation Who: Ministry of Energy, Ministry of Foreign Affairs (UD), KLD

3.4.5: Technology that reduces negative environmental impact How: Based on the latest knowledge about environmental impact and experiences from demonstration projects Who: Offshore wind industry with support from R&D environments
Coexistence and legitimacy
4.1.1: Develop decision criteria for the allocation of areas and licenses for offshore wind How: Development of objective decision criteria that define minimum standards for environmental impact Who: Ministry of Energy and KLD
4.2.1: Independent mediator in case of dissent How: Interdepartmental process for open discussion across ministries in the event of significant objections. If dissent persists, the matter is lifted to the government. Who: Ministry of Energy and the government
4.3.1: Participation in decision-making How: Early and high-quality processes for local and national participation in decisions regarding the allocation of areas and licenses for offshore wind. Who: NVE, stakeholders/developers
4.3.2: Two-way dialogue between the coexistence group and the Ministry of Energy How: The Ministry of Energy discusses and responds to the group's input Who: Ministry of Energy
4.3.3: Create a "manual" for nature and the environment How: The coexistence group develops a guide on how offshore wind projects should address nature and environmental issues. Who: The coexistence group

8. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 8: ALDFG IN THE BALTIC SEA

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8.1. SHORT CASE DESCRIPTION

Case Study 8 (CS8) addresses the governance of Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG) in the Baltic Sea. ALDFG harms marine habitats and wildlife and poses risks to human activities such as tourism and fishing. Despite policy and regulatory frameworks in place such as the EU's Zero Pollution Action Plan, Single-Use Plastics Directive and Port Reception Facilities Directive, and the HELCOM Regional Action Plan on Marine Litter (RAP ML), ALDFG in the Baltic Sea persists. The core governance challenges hindering the achievement of regional policy objectives include persisting gaps in knowledge and data, weak collaboration among key actors, and limited incentives for participation in collaborative actions.

Moreover, while a number of opportunities to improve management exist, there is no clear and simple approach to tackle ALDFG in the Baltic Sea, leaving policy makers to pursue disconnected and potentially ineffective ALDFG strategies. Successful ALDFG action depends on the interaction between EU rules, HELCOM processes, national implementation, and operational actors, including fishers, ports, waste managers, NGOs, and gear producers. Better coordination is also needed to strategically tackle the challenge, connecting activities across e.g. prevention, reporting, retrieval, port reception, waste handling, recycling or disposal, and producer responsibility.

The PermaGov project, collaborating with HELCOM and engaging with key stakeholders in the Baltic Sea region, conducted a scoping exercise to identify priority actions for improving ALDFG management. The exercise identified 15 potential actions that HELCOM could undertake to advance regional ALDFG governance and/or management. Based on this scoping exercise PermaGov proposed a governance solution to HELCOM which addressed regional ALDFG management.

However, HELCOM is not the only significant ALDFG actor in the region and the lessons learned from the scoping exercise can be generalized to other actors in the region. To this end, PermaGov has developed a more general set of ten priority actions for actors in the Baltic Sea region to jointly overcome identified ALDFG management and governance challenges. Action 1 - establishing a Baltic Sea ALDFG coordination forum – aims to bring together key actors to jointly tackle ALDFG. Actions 2-4 focus on building a shared understanding of ALDFG, consolidating knowledge and improved reporting needed to inform decision making. Actions 5-10 target specific gaps such as retrieval mechanisms, Extended Producer Responsibility (EPR) schemes, gear marking and labelling, port and waste management, national implementation, and recreational fisheries.

8.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 8

The governance strategy was developed through an iterative process combining case analysis, desk-based review, interviews, workshop discussion, and refinement of proposed actions. The starting point was the governance challenge identified in the case: "*Efforts to address ALDFG are weakened by disconnects between EU-level policies (e.g. the Extended Producer Responsibility - EPR - and Port Reception Facilities directives), regional HELCOM initiatives, and national implementation. Without clear coordination between ministries and*

alignment between scales, responsibilities remain fragmented, which slows down or limits progress towards EU Green Deal goals" (Deliverable 6.1[52]).

This fragmentation affects how actors coordinate, share information, and follow up on existing initiatives. Thus, without clear coordination between ministries and alignment between scales, responsibilities and actions remain fragmented, which limits progress towards policy objectives under the EU Green Deal and the HELCOM Revised Regional Action Plan on Marine Litter. Moreover, a number of cross-cutting challenges such as knowledge gaps, limited collaboration between key actors, weak incentives for participation exist, while policy makers are burdened with a wide number of potential, yet untested, management strategies to address ALDFG to select from.

The strategy-development for CS8 process thus focused on addressing this challenge and offering a practical and feasible governance solution. The process moved through three steps: ideation, prototyping, and testing. Ideation was used to define the preferred end-state and identify possible action areas. Prototyping was used to refine these action areas into a central governance proposal: A coordinated approach to abandoned, lost, or otherwise discarded fishing gear in the Baltic Sea – including 10 priority actions. Testing was used to discuss, refine, and assess the proposed actions in relation to feasibility, actor roles, implementation risks, and links to existing regional processes.

Ideation

The ideation stage focused on defining the preferred end-state for Baltic ALDFG governance and identifying the main actions needed to move towards it. The process was informed by case analysis, desk-based review, 14 interviews with regional actors, discussions with HELCOM, and the 1st Informal Consultation Workshop on measures targeting ALDFG. The aim was to develop a consolidated and refined understanding of the identified governance challenges and initial priorities tackling such challenges.

The ideation stage identified several key obstacles hindering policy progress: information and data gaps that reduce transparency and hinder NGO advocacy and monitoring; lack of coordination between EU, regional, and national levels; national challenges for HELCOM Contracting Parties to meet RAP ML actions; mismatches between new regulatory demands and the operational capacity of (smaller-scale) fishers; weak integration of actors such as gear producers and importers, ports, waste managers, and fishers into ALDFG actions; port infrastructure and waste management deficits that limit gear waste collection and recycling.

The resulting preferred end state is: "Better coordination across national, regional, and EU governance levels" because: 1) efforts to address ALDFG are negatively impacted by disconnects between EU-level policy frameworks, regional HELCOM initiatives, and their implementation at the national level; 2) it is important to achieve progress on multiple issues; 3) HELCOM offers institutional capacity and willingness to lead cross-national initiatives.

[52] Falk-Andersson, J., Christina Kelly, Nelson F. Coelho, Moses Adjei, Riku Varjopuro, Luke Dodd, Päivi Haapasaari, Sun Cole Seeberg Dyremose, Gitte Davidsen, Daniele Pagani, Jane Kruse, Shannon McLaughlin, Antoine Lafitte, Lindsey West, Kåre Nielsen, Neil Farrington, Judith van Leeuwen, Ben Boteler, Cristian Passarello, Helder Pereira, Andreas Kortenhaus, Matteo Alexander Nenciolini, Giulia Prato, Andrea Zanella, Troels Jacob Hegland (2025, unpublished). "Deliverable 6.1 Co-production of joint problem statements and actionable insights". PERMAGOV project.

As a result of this step, several possible action areas were considered, including coordination measures, shared-understanding activities, fisher-facing guidance, retrieval guidance, waste-management actions, exchange on Extended Producer Responsibility (EPR), reporting improvements, and data-sharing measures. These were assessed qualitatively in terms of desirability, viability, and feasibility. Actions related to coordination, stakeholder engagement, and consolidation of existing knowledge appeared more immediately feasible. More demanding actions, such as regional standardisation, harmonised gear labelling, or a full regional waste-management strategy, may be more longer-term possibilities because they require stronger political agreement, resources, or action at EU or national level.

Prototyping

The prototyping stage translated the initial ideas into a more refined idea. The prototyping phase was conducted in collaboration with HELCOM, providing strategic input and advice to develop a prototype that complemented and linked to the RAP ML. This resulted in 6 action blocks (groups of actions) and 15 specific actions (see Table). The intended audience of this step was HELCOM Contracting Parties, and in particular members of Working Groups GEAR and Sea-based Pressures.

Action Block	Actions
1. Governance, strategic partnerships and community dialogue	1. Continue cooperation with the Global Ghost Gear Initiative (GGGI) 2. Increased coordination 3. Develop common understanding
2. Guidelines / Best Available Technologies / Best Environmental Practices (Guideline/BAT/BEP) actions related to ALDFG	4. Improve quality and dissemination ALDFG resources for fishers 5. ALDFG retrieval best practices/guideline 6. Develop and/or adopt a best practices document or recommendation for national management of ALDFG issues
3. ALDFG reporting and data actions	7. Standardization of commercial lost gear reporting 8. Standardization of recreational lost gear reporting 9. Improve lost gear data sharing
4. Gear marking and labelling actions	10. Implement point-of-sale gear marking requirements 11. Regionally standardize gear labelling
5. Waste management actions	12. Fishing gear Extended Producer Responsibility (EPR) best practice sharing 13. Strengthen management of retrieved gear 14. Strengthen regional waste management

	strategies to address ALDFG
6. Cross-cutting and additional actions	15. Update HELCOM Science Agenda

Testing

The testing stage focused on discussing and refining the proposed governance action blocks/actions rather than piloting it in practice. The actions were tested through workshop discussion, exchanges with HELCOM, and reflection on feasibility, actor roles, and implementation risks.

The "1st Informal Consultation Workshop on measures targeting ALDFG" held in January 2026 (1 day online) was key to the testing phase and brought together 18 participants (9 WG members; 4 official observers; 3 external guests; and 2 representatives of the HELCOM Secretariat). Workshop participants were provided with the proposed action blocks / actions prior to the workshop to provide them opportunity to review the proposed actions as well as discuss with national ministries and experts. For each of the 15 actions, the following information was provided: name, description, justification (i.e. link to identified challenges), suggested HELCOM actions, suggested completion criteria, important actors (i.e. key actors for the achievement of the action), synergies (i.e. links to other proposed actions), references (i.e. links to relevant sources), desirability (i.e. an assessment of how the action helps to overcome identified challenges), and feasibility (i.e. an assessment of implementing the action).

The testing process helped clarify that HELCOM is well placed to convene and support a regional coordination process, but that implementation would depend on the participation of Contracting Parties, fisheries actors, ports, waste-management actors, producer-responsibility actors, civil-society organisations, and other relevant stakeholders. The workshop during the testing stage also helped to ensure that the strategy remained focused, realistic, and aligned with EU, regional, and national policy processes.

8.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

8.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

The strategy focuses on delivering a coordinated approach and ten priority actions for actors in the Baltic Sea region to jointly overcome identified ALDFG governance challenges. Action 1 - establishing a Baltic Sea ALDFG coordination forum – aims to bring together key actors to jointly tackle ALDFG. Actions 2-4 focus on building a shared understanding of ALDFG, consolidating knowledge and improved reporting needed to inform decision making. Actions 5-10 target specific gaps such as retrieval mechanisms, Extended Producer Responsibility (EPR) schemes, gear marking and labelling, port and waste management, national implementation, and recreational fisheries. The ten priority actions include:

Action 1: **Establishing a Baltic Sea ALDFG coordination forum** that brings together key actors for experience sharing and cross-sectoral problem solving with attention to fishers' participation.

Action 2: **Develop a shared regional understanding of ALDFG** through a regional dialogue with key actors, including fishing organizations to underpin mitigation, retrieval and reporting.

Action 3: **Consolidate existing ALDFG knowledge into targeted resources for regional actors** as relevant knowledge is currently dispersed across different platforms.

Action 4: **Improve ALDFG reporting and data sharing to inform decision making, monitoring, and policy evaluation.**

Action 5: **Support ALDFG retrieval strategies through sharing of regional guidance and best practices**, with regionally specific guidelines addressing ecological and safety risks.

Action 6: **Advance Extended Producer Responsibility (EPR) schemes for fishing gear with industry**.

Action 7: **Accelerate gear marking and labelling actions** through a feasibility assessment of cost-effective gear marking technologies, small scale pilot projects, and a standard regional approach to gear labelling.

Action 8: **Strengthen regional port and waste management strategies** by developing a regional ALDFG waste strategy.

Action 9: **Advance national level implementation of ALDFG policies** by co-identifying challenges and best practices

Action 10: **Accelerate action to address ALDFG from recreational fishing** by raising awareness, improving data collection and promoting environmentally friendly material.

The ten actions are a refinement from the 15 actions selected during the testing phase and are result of workshop discussions.

Box 1: PermaGov's recommendation to HELCOM.

PermaGov Recommendation

Based on a regional governance analysis of abandoned, lost or otherwise discarded fishing gear (ALDFG)[1], the outputs of various projects and partner organisations[2], and the outcome and discussions of the 1st Informal Consultation Workshop on measures targeting ALDFG (IC WS ALDFG 1-2026), the PERMAGOV project recommends the following action as the sole ALDFG focused action in the forthcoming update of the HELCOM Regional Action Plan on Marine Litter (RAP ML):

HELCOM, in close collaboration with key stakeholders, will initiate the establishment of and further contribute to the establishment and activities of a regional forum on ALDFG targeted toward experience sharing and cross-sectoral problem solving.

Rationale

ALDFG remains a significant challenge in the Baltic Sea. Despite recent advances in the regulation of ALDFG, particularly at the EU-level (Single-Use Plastics Directive, Port Reception Facilities Directive, Regulation (EU) 2023/2842 on fisheries control), coordination on the topic is noticeably lacking. This is particularly true in the case of industry actors where command and control regulation and market forces are the primary regulatory instruments. During IC WS ALDFG 1-2026, coordination and stakeholder engagement were a near ubiquitous point of discussion regardless of the action being considered. While there are numerous opportunities to advance ALDFG management, PERMAGOV believes this coordination action to be fundamental to the success and impact of nearly all other potential measures. HELCOM needs strong partners among industry and fishers in order to deliver on the goals of a Baltic Sea unaffected by hazardous substances and litter.

PERMAGOV believes that by adopting this action first and exclusively, it sends a strong message regarding the importance of broad stakeholder engagement. By opening the regional management agenda to the broader ALDFG community, HELCOM can increase the effectiveness of almost any ALDFG action though increased buy-in and cross-sectoral synergies. It also ensures that advisory material (e.g., best practice guides) developed at the regional level are maximally relevant and adopted by stakeholders.

Germany's Runder Tisch Meeresmüll (Round Table on Marine Litter) stands as a strong model of stakeholder engagement on this topic. Since 2016, it has brought together experts from fisheries, shipping, the plastics and packaging industry, waste management, retail, science, environmental NGOs and government authorities to coordinate national action on marine litter. It demonstrates what a deliberative, multistakeholder forum can achieve, and Germany's decade of experience running it makes it an ideal model for a regional ALDFG forum. Given its regional mandate, HELCOM is well placed to facilitate such a process:

Implementation

Step 1: Identify and secure the participation of key founding partners - HELCOM should first identify a group of core partner organisations willing to contribute to establishing the forum. The goal of this step is not to launch the forum immediately but to secure a committed and representative group willing to contribute to the establishment process. PERMAGOV suggests initial approaches to the following organizations: World Wildlife Fund, Global Ghost Gear Initiative, Baltic Sea Advisory Council and its membership, Kommunernes Internationale Miljøorganisation (KIMO), European Fishing Tackle & Trade Association, Baltic Ports Organization and its membership, European Waste Management Association and its membership, National fishing management authorities. However, this list is not exhaustive, and targeted recruitment will be needed to achieve representative participation.

Step 2: Establish the forum's structure with founding partners - Once a sufficiently representative founding membership has been secured, HELCOM and its co-founders will jointly construct the forum. This means agreeing on its mandate, governance model, membership rules, meeting format, and initial work programme. PERMAGOV suggests that the stakeholder's adopt a co-management approach based in equal standing among participants, open membership, and deliberation. Germany's experience with the Runder Tisch provides a ready-made template for this design and outreach process. PERMAGOV also recommends adopting a neutral branding that is not directly associated with any particular actor.

Step 3: Launch and broaden membership - Launch the forum to other stakeholders and the public and implement the initial work programme, which could include consolidating knowledge on ALDFG-related policies and implementation, facilitating data exchange, and identifying shared priorities for joint action in the Baltic region. PERMAGOV recommends investing in the public visibility of the forum, similar to what is done for large projects. Additionally, all forum outputs should remain attributed to the forum exclusively to minimize the perceived role of any single member.

[1] PermaGov project deliverables
[2] Global Ghost Gear Initiative (2021) Best Practice Framework for the Management of Fishing Gear; Tschernij et al. (2019) The Baltic Sea Blueprint: A Step-by-step Roadmap on How to Approach Derelict Fishing Gear. MARELITT Baltic Project.; cyclos GmbH, WWF Mediterranean Marine Initiative (2024) Extended Producer Responsibility for Fishing Gear. Development of a blueprint for implementation.

8.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

The governance strategy is built on the MLCMG model (institutional barriers, collaborative dynamics, governance capabilities, and e-governance) while some components of the model can be more easily recognised than others. For example, Action 1 clearly focuses on improving collaborative dynamics while Actions 2, 3, 5, 7, 8, and 9 have clearer links to governance capabilities, Action 4 links to e-governance, Actions 6 and 10 link to institutional barriers (e.g. actor connectivity).

The proposed regional ALDFG forum (Action 1) is designed to create a setting for collaborative action through principled engagement, shared motivation, and capacity for joint action. These are central elements of collaborative dynamics in the model. This also links to the institutional barrier of 'actor connectivity'. The forum responds directly to the fragmented character of Baltic Sea ALDFG governance. Its purpose is to support shared problem definition, deliberation, trust-building, and coordinated follow-up. The proposed forum thus creates a mechanism to link ALDFG discussions across governance levels and across sectors. It also supports improving governance capabilities (e.g. agility and responsiveness) by enabling actors to review priorities, respond to implementation barriers, and adjust activities over time.

The strategy also relates to governance capabilities (Actions 2, 3, 5, 7, 8, and 9) by boosting the capacity of key actors to respond to identified challenges. These actions primarily focus on improving knowledge and understanding of ALDFG, promoting and sharing best practices, and developing targeted strategies for specific actors. There is also a connection to institutional barrier 'development and use of knowledge'.

The governance strategy also relates to e-governance (Action 4) given the actions on improving reporting and data-sharing. In this case, the strategy seeks to improve how existing and emerging reporting systems can support governance as well as by making ALDFG-related information more usable, accessible where appropriate, and better connected across commercial fisheries reporting, recreational fisheries reporting, and public or civil-society reporting. There is also a connection to institutional barrier 'development and use of knowledge'.

Finally institutional barriers (actor connectivity) can be witnessed in Actions 6 and 10, as the governance strategy acknowledges the need to better integrate some actors within the coordinated approach to ALDFG in the Baltic Sea.

8.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

The governance strategy mainly fits the *policy-making type in the PERMAGOV strategy matrix*. It is connected to an established governance arrangement, namely HELCOM and the

forthcoming update of the Regional Action Plan on Marine Litter, and it aims to develop a concrete governance pathway for ALDFG in the Baltic Sea. The strategy is therefore intended to provide action-oriented recommendations (10 Actions) that can support policy implementation and follow-up.

The recommendations on coordination, stakeholder engagement, consolidation of existing outputs, retrieval guidance, management of retrieved gear, and reporting provide practical priorities that can be taken forward within the established regional process. At the same time, the strategy also contains elements of creation of alternative solutions, as it is possible to prioritise or implement action in an iterative process, building on subsequent outcomes of previous actions.

Some parts of the strategy also support understanding transition potential. This applies especially to the recommendations on developing a shared understanding of ALDFG and consolidating existing knowledge. Thus, *the strategy is best understood as a policy-making strategy with elements of alternative solution development and problem-framing*.

8.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

Sustainability risks

- No detailed SDG-by-SDG risk assessment was conducted, so specific risks to individual Sustainable Development Goals are not identified here.
- The strategy's sustainability contribution may remain limited if e.g. coordination or knowledge enhancing actions do not lead to practical follow-up on proposed actions on e.g. retrieval, waste management.

Political risks

- The proposed forum may not be taken forward if HELCOM, Contracting Parties, and relevant stakeholders do not support it.
- The strategy may lose focus if coordination is not implemented as a key priority.
- Fishing, producers, port, and waste management actors may not be sufficiently involved, which could weaken shared understanding of ALDFG.
- Commercial reporting standardisation may be politically or practically difficult if pursued too quickly, because reporting is governed by EU rules and national implementation systems.
- More ambitious actions, such as gear-labelling harmonisation or EPR best-practice documents, may face political limits because they depend on actors and decision-making processes beyond the region (i.e. HELCOM) alone.

Resource-related risks

- Establishing or strengthening a regional ALDFG forum requires committed founding partners and coordination capacity.
- Consolidating knowledge into clearer resources requires staff time and technical effort.
- Periodic review and refinement of the strategy requires follow-up capacity, without it, the strategy may remain a vision rather than an adaptive governance pathway.

8.4. REFLECTIONS ON THE METHODOLOGY

The governance strategy was developed through a flexible process structured around ideation, prototyping, and testing. In the Baltic ALDFG case, this process was used to move from the identified coordination challenge towards a more concrete governance strategy. The process focused on identifying possible actions, refining them, and organising them into a phased strategy centred on improved coordination.

The selection of actions was guided by their relevance to the identified governance challenges, potential to contribute to EU and regional policy objectives, and their fit with regional coordination processes under HELCOM.

Validation should be understood as discussion and refinement of the proposed strategy, not as formal adoption or testing. The strategy was refined in relation to HELCOM discussions and workshop consultation, with attention to desirability and feasibility, and the role of different actors. A key methodological lesson is that the process helped narrow a broad set of possible ALDFG actions into a focused governance pathway. However, the strategy remains a proposed pathway and should therefore be reviewed periodically and reassessed against local conditions before being applied in another sea basin or to another plastic source.

9. REPORT ON MARINE GOVERNANCE STRATEGY FOR CASE 9: AGRI-PLASTICS IN THE SPANISH MEDITERRANEAN

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9.1. SHORT CASE DESCRIPTION

Our case study focuses on the contestation between agricultural and environmental actors in the management of the Marina of Cope with a view of improving knowledge of each group's management needs. The Marina of Cope, located in the south of the Region of Murcia, Spain, is a Regional Park and biodiversity hotspot for semi-arid and coastal ecologies. It is also an agricultural hub, formerly of traditional dry agriculture and in recent decades of intensive irrigated agriculture.

The area was declared a regional park in 1992, however, since its inception it has been rife with societal contestation, primarily on the basis of the agricultural sector's rejection of such a denomination. Despite regulation requiring two management plans within two years of such a declaration, one for zoning and environmental goals, and one for the regulation of activities, no management plan yet exists. As a result, the region lacks formal governance controlling how activities may be carried out and how to protect wildlife. Through PERMAGOV's research, we have found that this regulatory grey area has only further exacerbated contested governance dynamics. Questions such as how biodiversity should be protected or how activities should be conducted become points of debate by either side.

Further, our research found that the reflexivity of these actors to know, perceive, and empathise with each group's needs is significantly constrained. Both groups felt like they were not heard, ignored, not considered, and even vilified, by governing institutions and by the other groups further entrenching these actors within their perspectives. These challenges in reflexivity reduced collaborative dynamics and cross-sectoral solutions to effective governance within the Marina. We took this issue as our entry point for developing governance strategies to improve governance to be able to better support farmers whilst achieving environmental protection for the region's biodiversity.

Our work has focused on working with both groups, to actively listen to the needs of both groups, understand where tensions lie, and where potential points of cooperation may exist. We seek to improve reflexivity by representing the realities of both groups, on their terms. Our main body of work was a series of workshops with each group to imagine their desired management for the Marina, from which we have developed a policy brief with measures to be taken by both groups.

9.2. DEVELOPING GOVERNANCE STRATEGY FOR CASE 9

Stage 1: Preferred-end state

This phase was completed mainly via individual interviews with the differing actors in the region in Sprin 2025. During this period, we interviewed actors to understand in detail their needs for the Marina, the key issues they faced, and what kind of solutions they would prefer.

These interviews confirmed that the challenges of cross-sectoral contestation and the lack of collaborative dynamics was a shared issue that was prioritised by both environmental and agricultural actors. Further, here we identified that it was the capability of reflexivity upon which some of the core governance challenges emerged, and as such, the best entry point for our governance strategy.

After conducting interviews, a problem statement of the desired end-state was developed. This preferred end-state was one in which there was reduced contestation and, potentially, co-management of the region.

Stage 2: Ideation

This phase we designed which form of solution or intervention would be best suited to the contextual needs and particularities of this case study. Here we outlined how at this stage, to support reflexivity, the ideal solution was to provide a space for each group to be heard about the challenges and their needs for the Marina with a view of improving knowledge of each groups' needs and how policy can best work with these needs.

For this we designed a series of workshops, one for farmers and one for environmental actors, in which they would have the space to design their desired governance of the Marina and to express their realities and needs for governance.

Stage 3: Ideation with the community

In Spring 2026, we conducted the workshops in which we asked the actors themselves to ideate their desired Marina and governance needs. We worked closely with Jose Ferra from Ambiente Europeo, a representative from the region who has worked formerly with farmers as a local expert to support the running of these workshops. In the farmer workshop, 8 farmers with land in the Marina were present. This workshop was focused on the challenges that farmers face from environmental regulation and how it impacts their capacity for economic viability in the region. In the environmental workshop, 25 members from leading CSOs across Murcia were present, including a farmer, which had a focus on solutions for fostering increased cooperation with the agricultural sector.

Stage 3: Prototyping

Following the workshops, a policy brief which highlights the governance strategies for both farmers and environmentalists, a section where tensions and points for cooperation lie, as well as policy recommendations have been created.

Stage 4: Testing

This policy brief has been sent to representatives of each group to validate our understanding and to ensure that we have adequately represented their needs.

9.3. DESCRIPTION OF THE GOVERNANCE STRATEGY

The governance strategy is available on https://www.permagov.eu/results

9.3.1. SUMMARY OF THE GOVERNANCE STRATEGY

Recommendations to support collaborative and empowering co-management in the Marina of Cope

Governance in the Marina of Cope has been stalled and frustrated for multiple decades, resulting in fragmented governance, a polarised community, and an inability to develop holistic and supportive cross sectoral understandings of the issues they face and solutions to collectively overcome them. This policy brief provides recommendations to support the Regional Government of Murcia, and other implicated local and national institutions, in resolving these fragmented governance challenges through enabling processes of trust building, dialogue, and implementing co-management in the Marina of Cope.

FRAGMENTED GOVERNANCE IN THE MARINA OF COPE

The Marina of Cope, the southernmost region in Murcia, Spain, is characterised by a lack of effective governance that can account for the shared needs of the agricultural and environmental protection sectors. Collective land-use priorities should be managed under Regional Park rules, but since the Marina's declaration as a Park in 1992, no management plan has been implemented. This governance challenge primarily takes root in the contested dynamics between environmental and agricultural sectors. Farmers reject environmental measures, notably the required management plan as an imposition on their livelihoods. Environmental actors are frustrated with the lack of progress to secure protection for the Park against economic activity. With the absence of the management plan, the entire region is overlooked within governance. Both farmers and environmental protection are underregulated, and therefore undersupported, by the institutions that have competence over their wellbeing. Both sectors seek to informally navigate this absent governance but without guidelines and clear leadership, contestation between the two occurs leading to polarisation and a fragmented community. For effective governance, attention must be paid to this polarisation and trust within the community rebuilt to reduce sectoral divides. In the PERMAGOV project, we have engaged with both sectors and developed policy briefs which individually address their unique governance needs and visions for the Marina. This policy brief brings the individual visions of the agricultural and environmental sectors together, providing actionable recommendations that stem from the recommendations of the community members themselves. It identifies where tensions exist and where opportunities emerged to work together, across sectors, towards a common vision for the Marina. This policy brief aims to serve as a foundation for policymakers to embark on the process to invigorate governance in this region founded on recognition, dialogue, mutuality, and local empowerment. Ultimately, we recommend co-management as the best solution to achieve these aims as a collaborative and empowering solution that can support weaving together the fragmented governance of the Marina of Cope towards a collective goal.

CO-MANAGEMENT IN THE MARINA OF COPE

Shared meanings and visions for the Marina of Cope: Shifting from environmental protection to protection with farmers

Environmental actors seek to protect and preserve the natural values of the Marina of Cope, as a wild and relatively 'untouched' ecosystem. As such, measures often seek to protect these wild spaces from human economic activity enforcing a distinction between natural spaces and human activity. Contrastingly farmers see themselves as a fundamental element of the Marina's ecosystem: their families have lived there for generations and they have grown up and made their lives there. The Marina is their home, their source of livelihoods, and their culture. As such, rules enforcing a separation between farmers and their land drives contestation. For holistic management, a shift needs to occur in the framing of environmental protection towards protection with the farmers of the Marina. This shift should focus on building a collectively-agreed vision of what the Marina means for all sectors as members of a community. A vision which accommodates the Marina as a source of natural value but also one which includes the farmers as an integral part of the ecosystem. The foundational element of protecting with is creating a space which can balance and integrate the different meanings all sectors hold with regards to the Marina so that these groups can identify themselves in these processes and how they contribute to the collective meanings that emerge for the

community as a whole. As such, in the Marina, the ‘wild landscape’ must be integrated with the farmers who work within such landscapes. With this view, the needs of the Marina become inseparable from the needs of the farmers, and for governance to support collective solutions, the environment cannot be considered without the farmer, and vice versa.

Actor interactions: Creating collaborative, participatory, and empowering processes for local actors

Dialogue: trust and cooperation are broken between agricultural and environmental actors. However, both sectors have expressed a desire to resolve these tensions with dialogue emerging as a foundational priority action. Co-management: Local actors are frustrated by their lack of ability to influence decision-making. They propose co-management as their main solution for collective and active participation. They devised a system based on three co-constitutive bodies: *the deliberative*, has wide participation from all sectors to deliberate and prioritise needs and actions, *the scientific*, holds scientific and technical sector experts to inform deliberative and executive actions, and *the executive*, has citizen and administrative representatives to execute priorities.

Evidence-informed decision-making: Co-production with differing knowledges

Differing knowledges are prioritised between the differing sectors. Each sector currently perceives these knowledges as contrasting and often exclusionary, leading to contestation. Co management should reframe such knowledges as complimentary. Within environmental decision-making, scientific knowledge on ecological processes is deemed the most important. However, this often excludes social and lived knowledges of actor needs and realities, often resulting in ineffective policies. Therefore, engaging with actors, like farmers, who are experts in their sectors, and hold valuable experiential knowledge of the Marina, is essential for a full understanding of cross-sectoral challenges. Further, when excluding the lived and experiential knowledges of the farmers, these actors feel undervalued and ignored from decision-making processes driving contestation and polarisation. Co-production processes need to be created that 1) value the insights from these differing knowledge systems and 2) combine them, where they are shared but also where they contrast, to provide a broad understanding for effective cross-sectoral rulemaking.

Resources: Supportive policy implementation

Farmers are frustrated at environmental measures which do not consider the economic or infrastructural barriers they face. Often, requirements are not met with necessary support or infrastructure, leading to ineffective implementation for farmers and the environment. Effective implementation requires: Supporting policy implementation Where policies require infrastructure or resources to implement or transition to new policy requirements explicit attention should be paid to ensuring localities have access to such resources. Regional or national actors should endeavor to work with local municipalities to ensure that local actors have access to such resources Supporting actor livelihoods Environmental decision-making can often be perceived as coming at the cost of people’s livelihoods, provoking conflicts and polarisation Environmental decision-making should engage with, and pay particular attention to, the local economic actors who are impacted by such requirements to design measures that enable actors to practice sustainable but also economically feasible livelihoods.

NEXT STEPS FOR POLICY MAKERS

1.Trust building with local actors:

Trust needs to be built between decision-makers and the local community. To do so, we recommend initiating processes of active and non-prejudiced engagement with local actors by individual sectors first, to listen, engage, and understand their realities, needs, and ideas for solutions.

Who? Regional Government of Murcia's competent departments with all relevant sectors in the Marina

How? Identify the differing sectors within the Marina and current dynamics shaping interaction between them. Strengthen and establish processes to connect and engage with the sectors of the Marina. Establish channels of clear communication with sector leaders to facilitate context-appropriate contact.

2. Supporting community dialogue and cooperation:

Trust also needs to be built within the community to support community members to develop shared meanings and understandings of their homes and to enable cooperation between sectors. We recommend that it be locally led, but institutionally backed, to develop and retain local community bonds.

Who? Sector representatives, Local Municipality representative, Regional Government of Murcia

How? Establish a responsible person(s) within the local municipality to design and initiate the process of dialogue. Identify from individual sector engagement the shared needs and priorities. Establish processes premised on accounting for and weaving together plural values and realities. Create routinary spaces within the locality for dialogues to take place.

3. Establishing co-management of the Marina of Cope:

To enable context-relevant, empowering, and cooperative decision-making that bridges sectoral divides, we recommend establishing a co-management regime of the Marina of Cope that is grounded in community solidarity and whose design and processes are developed with the community members themselves.

Who? Regional Government of Murcia, Local Municipalities, Community Sector Representatives

How? Deliberate with sector representatives the desired co-management bodies, processes, and principles. Develop shared community vision and mission for co-management bodies. Deliberate with Regional Government processes for formalisation and institutional support.

4. Review policy priorities for community of the Marina:

As the first step for co-management in the Marina, initiate a revision of the policy priorities, according to current and contextual realities, that are aligned with co-management mission and vision.

Who? Co-management bodies of the Marina of Cope

How? Listen and identify with each individual sector their challenges, needs, and priorities. Identify where needs intersect and potential points of tension. If needed, mediate and negotiate potential points of tension to establish a collective approach. Develop community policy priorities to support a resilient and flourishing Marina of Cope.

5. Develop clear and transparent substantive rules formalising management of the Marina:

It is crucial that substantive rules are developed to effectively regulate economic activities in the Marina in line with environmental protection. These relationships should be established in line with the individual sectoral needs and collective priorities of the community. Such rules should emphasise transparency, reliability, accountability, and ensure economic and infrastructural support for implementing actors.

Who? Regional Government of Murcia, Co-management bodies of the Marina of Cope

How? Establish rules in line with co-management decision-making processes. Prioritise with sector representatives their economic or infrastructural needs for implementation. Monitor actor implementation to identify emerging challenges and support needs.

9.3.2. HOW DOES THE GOVERNANCE STRATEGY MATCH THE MLCMG MODEL

This governance strategy seeks to cohesively tackle the intertwined challenges of institutional fragmentation, frustrated governance dynamics, and constrained capabilities of reflexivity, rescaling, and revitalisation by enabling the capabilities of reflexivity and rescaling to support improved collaborative dynamics.

In the Marina of Cope, the underlying challenge is that of reflexivity between two policy domains and actor groups: agriculture and environmental protection. The contestation that has existed between these two groups for more than three decades has shaped the governance in the region into one which is highly fragmented, polarised, and unable to revitalise itself out of these stagnant dynamics because initiatives have not sought to bridge relationships, understanding, and reflexivity between the two groups. In both cases, the actor groups felt like they were unheard, vilified, struggling against a powerful contested actor, and that the Regional Government and competent authorities were not taking initiatives to support their cause. As such, both groups mirrored one another in that they kept on fighting to establish their needs and cause, to fight to be heard, and to achieve their desired governance outcomes both perceiving the other (reflexivity) as the source of their issues who held power over them. As a Regional Park, competence to take any form of action is reserved to the Regional Government, which was also a key disempowering dynamic because the Regional Government was reported by both groups as absent, as not consulting, including, or taking any form of action to reduce the agricultural and environmental issues that persisted. The local municipality also conferred that they had to operate on gentlemen's agreements or simply take unilateral action when measures needed to be taken to put protective barriers or other such measures in times of nesting or other ecological priorities further compounding the Regional Government's notable absence from the region.

Our end goal with this governance strategy was to enhance collaborative dynamics and community empowerment through enabling primarily the capability of reflexivity and, potentially, engage with the Regional Government to present the community's agreed upon policy priorities. As such, our first act was to provide a space for these two contested groups to feel heard, to voice their needs, their challenges, and their priorities for governance in the Marina. Over the course of a week, we worked in the region with a local expert who supported us in facilitating these workshops. These workshops, whilst not the final goal, were an integral element of the strategy because they made the first step in supporting dialogue. In the workshops with the farmers, they expressed how this was the first time someone had sat down

with them, with a view of supporting them, to talk about their issues. We spoke at length for over four hours about their realities, mostly to express the insurmountable challenges they face and the lack of support they feel they have from Administrations and their wider community. Creating a space for the farmers to feel heard enabled them to move into a more reflexive mindset in which they were open to finding collaborative ways to achieve common aims within the Marina. In the environmental workshop, a farmer who was also present at the agricultural workshop was present, deviating from our original methodology. Despite initial tensions, this proved to be a highly transformative experience as these environmental actors had the space to dialogue with a farmer with a mediator/facilitator present. By acknowledging the challenging realities of farmers, and the need to engage with them for effective environmental decision-making, the farmers and environmental actors began a process of dialogue in which they were able to identify many shared issues and how solutions existed that supported both agricultural livelihoods and environmental protection, like the need for a local composting plant.

The results of these two workshops are two policy briefs which are intended to be sent to the participants for them to use in campaigns or in their work with administrations in which their needs are clarified. These two policy briefs aim to enhance reflexivity by making known the needs of both groups to improve shared understanding and to form the basis or 'negotiating points' of future dialogue initiatives. Further, our main governance strategy, the Policy Brief for co-management, seeks to bring these two realities together, exemplifying how these 'contested' realities are indeed complimentary and, in the majority of cases, similarly shared.

As trust has been built within and between sectors, we will run a closing workshop in which we invite representatives of the differing sectors to present our results and to ask the community members to imagine which steps they can take to carry this work forward. This workshop has two main purposes: to further enhance reflexivity through shared understanding and to empower the citizens to see their own agency to seek collaborative solutions to resolve the persistent issues that they both face.

Finally, we are currently in communication with the Regional Government as a way to enhance rescaling, to provide them with the positive outcomes that such a project can have on community building and the common policy priorities to be considered for execution by the competent authorities.

In this way we hope that through enabling reflexivity and rescaling, a revitalisation may occur that can support enhanced governance in the Marina of Cope.

9.3.3. HOW DOES THE GOVERNANCE STRATEGY APPLY TO THE STRATEGY TYPES

This governance strategy is situated within a moderately unclear governance arrangement and the need to develop *a shared problem understanding.* It includes components of *to understand transition potential and the creation of alternative solutions*.

The governance arrangement of the Marina of Cope is informal but not whollly unestablished. There are a series of rules and regulatory pathways, they simply are not being implemented or engaged with due to administrative absence. It is primarily the contestation and polarisation that leads to actor and institutional fragmentation that is the core context in which this strategy operated.

As such, the primary goal is to first, with the workshops, to develop shared understandings by understanding the realities of these actors and their potential to transition towards a more collective imaginary and shared governance arrangement. However, the policy briefs themselves are a creative alternative solution to the current status quo and present a pathway towards supporting this co-management of the Marina in cooperation with all sectors.

9.3.4. RISKS TO SUSTAINABILITY AND IMPLEMENTATION

Sustainability risks

- No sustainability risk assessment was conducted and therefore cannot be provided in detail.

Political risks

- Tensions are still fraught within the community, it is possible that despite our intentions of supporting these actors to see their shared commonalities, tensions may still persist and our aims go unachieved
- It is possible that by engaging on the topic of polarisation, it may make it more apparent and alive in the actor's perceptions, therefore having the opposite effect of what was desired
- It is possible that any actors or institutions involved in this process may misuse the information provided by actors within the workshops, breaking the trust that has been built and their hopes on seeking solutions resulting in negative perceptions towards future initiatives which may seek to work on collaboration and less willingness to be open to dialogue

9.4. UPSCALING

The generalisable issue that our case study extends to is the ever-increasing polarisation and conflict between environmental policy initiatives and economic actors, particularly agricultural actors. Our research shines a light on the realities of the agricultural actors who reject environmental policies and the potential prejudice that exists on how environmental actors and decisionmakers should engage with them. These measures are in support of the Ocean Pact priority to support coastal and island communities. We have the following generalisable findings for such cases:

1. Environmental policies which suppose an economic or infrastructural burden for the agricultural sector should take effort to understand the abilities of these actors, particularly small and medium scale actors, to be able to implement them.
2. Engagement with these actors, not only large-scale lobbyist but also local cooperatives and representatives, are encouraged to be invited to participate from the beginning, in an open and collaborative process that places equitable weight on the wellbeing of the environment and farmers.
3. In areas where land-use conflict exists, it is important for competent institutions to support initiatives in which these contested actors have space to first voice their needs, without prejudice or requirement, and to have their priorities accounted for, equitably. The priority of these initiatives should be in supporting these communities to develop

collective understandings, identify their commonalities, and ultimately building dialogue premised on compassion.

4. Co-management is a desired solution to enhance local empowerment, support community dialogue, and ensure that solutions are adapted to local contextual realities.

9.5. REFLECTIONS ON THE METHODOLOGY

The methodology was very useful in providing a structure in which to think through with the local actors their desired Marina. In particular, the use of forecasting provided a space in which to move into creative ideas and imaginaries that allowed actors to step out of truncated patterns and into new potential transformative solutions. For the farmers it was not as easy as they first needed to express the weight of their current situation so moving into the 'solution' space was not something that they were immediately ready for and required time and conversation.

The backcasting further provided an empowerment tool, to ask the actors themselves: what can I do, now, to make that dream future a reality?

This will be the methodology we employ in our closing workshop in December.