



European Missions



Restore our Ocean and Waters by 2030

Implementation Plan

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Executive Summary

The objective of this Mission is to restore the health of our ocean and waters by 2030. The Mission is designed to deliver on the European Union’s 2030 quantified and measurable targets for protecting and restoring ecosystems and biodiversity, for zero pollution, and for the decarbonisation and reduction of net greenhouse gas emissions towards climate-neutrality, within the EU’s ocean, seas and waters¹.



Figure 1 Mission Starfish, as proposed by the Mission Board Healthy Oceans, Seas, Coastal and Inland Waters²

The European Union can only fulfil its *European Green Deal* objectives by restoring the good health of the ‘hydrosphere’³, the single connected system of the ocean, seas, coastal and inland waters, which covers around 75% of the Earth’s surface. Life on Earth depends on a healthy hydrosphere to maintain a rich biodiversity and functioning ecosystems that provide oxygen, drinking water and food. Pollution-free waters are critical for the health of both citizens and planet. For the citizens of Europe and the world, the health of the ocean and waters will shape their very real conditions of life. Healthy ecosystems support the transition to climate-neutrality, as the ocean is one of the planet’s most important carbon sinks⁴ and its resources, wind, tides and waves, provide clean energy. Healthy waters are also of great economic importance. By 2030, the ocean alone is estimated to generate EUR 2.5 trillion⁵ of goods and services annually whereas water-related services provided by nature are valued at around EUR 24 trillion per year⁶.

However, marine and freshwater ecosystems are rapidly degrading⁷. In spite of ambitious legislation, efforts to protect their health have not been sufficiently effective⁸ and humanity is

¹ The geographical scope covers EU and adjacent waters in the basins bordering the European Union.

² Mission Board Healthy Oceans, Seas, Coastal and Inland Waters. 2020. Mission Starfish 2030: Restore our Ocean and Waters report. Publication Office of the EU: Luxembourg

³ Hydrosphere is used throughout this report to refer to the connected system of bodies of water such as the ocean, seas, coastal waters, rivers and lakes.

⁴ IPCC. 2014. Fifth Assessment Report: Synthesis Report Summary for Policymakers.

⁵ OECD. 2016. *The Ocean Economy in 2030*. OECD Publishing, Paris.

⁶ United Nations, 2021. The United Nations World Water Development Report 2021: Valuing Water. UNESCO, Paris.

⁷ EEA. 2021. *Europe’s marine biodiversity remains under pressure*.

⁸ Progress in reaching good environmental status has not been fast enough to cover all descriptors of the Marine Strategy Framework Directive in all EU waters by 2020 (cf. COM(2020) 259). A large majority of protected marine habitats and species are in unfavourable conservation status or their status is unknown

destroying this natural capital at an alarming rate⁹, shrinking its value by 40% since 1992¹⁰ and pushing the system over critical tipping points in the process¹¹. The degradation is undermining the hydrosphere's essential functioning as the planet's life-support system. Increasing frequency and intensity of floods, droughts and extreme weather as a result of a changing climate and hydrosphere threaten the lives and livelihoods of millions of Europeans. Restoring the health and natural capital of the ocean and water system is thus fundamental to ensuring the health, wellbeing and prosperity of Europe's citizens and of European society (see section 1.2). There is an urgency to act.

This Mission's strategic objective therefore is to restore the health of our ocean and waters by 2030. Restoring the hydrosphere requires a new systemic approach addressing the system as whole. This Mission will contribute to this approach with **three specific objectives** that are interlinked and mutually supportive (see section 1.3 for targets):

- i) Protect and restore marine and freshwater ecosystems and biodiversity,
- ii) Prevent and eliminate pollution of our ocean, seas and waters, and
- iii) Make the sustainable blue economy carbon-neutral and circular.

This Mission will deliver on the European Green Deal by “putting the blue into the green”. It will deploy **innovative solutions at basin-scale** (sea basin and river basin) for each of the three specific objectives (see section 2.2). It will thereby tackle the main interconnected drivers of the hydrosphere's degradation, i.e. unsustainable exploitation, pollution and climate change¹², low societal engagement and incomplete knowledge. It will support the development of technical, social, governance innovation and business models linked to the restoration of aquatic ecosystems and the development of a sustainable, resilient and climate-neutral blue economy. That effort implies by necessity a far-reaching technological, economic and social transition that must involve large parts of society.

To support all three objectives, this Mission will put in place **two enablers** (see section 2.3). First, it will foster a **digital ocean and water knowledge system**, with monitoring services to better understand, monitor and forecast the health of the hydrosphere that will build on and scale up existing and planned European infrastructures and services (Copernicus, EMODnet, Destination Earth, ERICS). Second, it will promote a **participatory governance based on public mobilisation and engagement**, empowering citizens to take action and drive the transitions through deliberative democracy, social innovation, citizen science and awareness campaigns.

This Mission will deliver on **Europe fit for the Digital Age**, through a digital blue transition. It will build on a digital knowledge system and on artificial intelligence products such as a digital twin of the ocean. It will make large use of satellite observation, remote sensing and

(cf. EEA. 2020. State of the Nature in the EU). The objective of the *Water Framework Directive* good status of water bodies was also only partially reached (cf. COM(2019) 95).

⁹ Maes et al. 2020. *Mapping and Assessment of Ecosystems and their Services: An EU ecosystem assessment*. JRC Science for Policy Report. Publications Office of the European Union, Ispra

¹⁰ Dasgupta, P. 2021. *The Economics of Biodiversity: The Dasgupta Review*. HM Treasury: London.

¹¹ Heinze et al 2021. *The quiet crossing of ocean tipping points*, Proceedings of the National Academy of Sciences Mar 2021, 118

¹² IPBES. 2019; *Global assessment report on biodiversity and ecosystem services* of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany, 2019.

high performance computing for ocean and water monitoring and foresight, and it will rely on digital technologies for broad societal engagement.

In the first ‘development and piloting phase’ (2021-2025), the Mission will roll out ‘lighthouses’ in major European sea and river basins, as the Mission sites (see section 2.1). Lighthouses will act as hubs and platforms for the development, demonstration and deployment of transformative innovations of all forms – technological, social, business, governance – in order to reach the three specific Mission objectives. They will integrate existing knowledge outputs and new knowledge, co-designed and co-implemented with citizens and stakeholders, ensuring local business participation and citizen engagement and outreach. They will be selected and implemented following the Horizon Europe principles of R&I excellence, impact-drive and competition¹³.

Due to the transboundary nature of waters and natural ecosystem continuity, implementation coordination and regional cooperation will be organised at the scale of sea basins and river basins, so that solutions are effective for resolving shared problems. The lighthouses governance will build on existing governance structures and will be established through a **political implementation charter** concluded among relevant Member States, the European Commission and other partners. The charter will commit the partners to cooperate and align resources to achieve the Mission objectives (see section 5). That approach will benefit from existing work, generate immediate progress and bring early results; it ensures quick traction and minimises the time spent on transitory preparation. All Member States will be involved in the lighthouses. **International cooperation** will be an important aspect of the Mission and its lighthouses, which will build on relevant existing international networks and initiatives. Therefore, this Mission will also contribute to a ***Stronger Europe in the World***, by positioning Europe at the forefront of international ocean and water restoration efforts. It will also contribute decisively to achieving the UN Sustainable Development Goals¹⁴ (see section 1.4).

Thus, by the end of this College in 2024, this Mission will put in place basin-scale cooperation supporting the implementation of the Mission lighthouses, pilot key research and innovation solutions, develop a precursor of the digital ocean and water knowledge system, mobilise and engage citizens and the public in the restoration effort through citizen assemblies, citizen science, stewardship and literacy campaigns. Moreover, the 2025 review at the end of the deployment and piloting phase will further assess the Mission objectives and targets with a view to further increasing their ambition.

In the second ‘deployment and upscaling’ phase (2026-2030), the solutions piloted in the first phase will be further developed and at the same time replicated and scaled up, enabling broad implementation and participation in the Mission across the EU and its bordering basins. Scale up actions will support moving R&I outcomes from the first phase to higher technology readiness levels (TRL), support market entry and accelerate the introduction of new solutions and technologies, in synergy with EU funds under shared management. R&I efforts will, in the second phase, continue to deliver comprehensive knowledge systems, as well as business, financial and social innovations and participatory research with strong citizen involvement. To support the scaling up and deployment of solutions, the Mission will contribute to creating a **dynamic investment ecosystem** (see section 3.2) to make the large

¹³ In line with the requirements for Mission R&I portfolios laid down in Article 2(6) of the Horizon Europe Regulation (Regulation (EU) No 2021/695, OJ (2021) L/170 p. 1.) Publications Office (europa.eu)

¹⁴ In particular SDG 14 Life below water and SDG 6 Clean water and sanitation

private and public investments needed to achieve the Mission objectives bankable and investable.

Within a decade, this Mission will help the EU to reach its ambitious 2030 targets for restoring the ocean, seas and waters, and to lead by example the global efforts towards ocean and water sustainability.

Are the Mission's objectives ambitious yet realistic? The Mission's objectives are **ambitious**, for two reasons. They reflect the political ambition of the European Green Deal, and they convert that political ambition into a transformational, decisive push that is needed to succeed in the nine years that remain until 2030. And beyond that: They reflect the responsibility towards future generations. Unless all possible resources are mobilised today, and urgently, a healthy ocean and healthy waters may be lost for them. ***Is that ambition realistic?*** The Mission will mobilise **all** relevant actors, provide the necessary innovation, knowledge and monitoring systems, activate Europe's public and create the conditions for private investments without which the transformation cannot succeed. It will congregate all actors involved to show that it is not only possible to halt the degradation of the hydrosphere, but also to restore its health. The Mission will provide a transformative platform which can crucially support an ambitious implementation, revision and further development of EU law and help to turn the European Green Deal goals into reality.

What added-value will the Mission provide? To realise the ambition of restoring the ocean and waters by 2030, a **decisive push is needed**. To reach the ambitious targets set in the European Green Deal, the EU Biodiversity Strategy, the Zero Pollution Action Plan and the EU climate policy, a transformational effort is required. The European Union's usual policy tools – legislation and EU funding programmes, existing and planned – will be necessary, but they will not be sufficient on their own. On top of and across existing EU legislation and programmes, an **additional, accelerated effort** is needed. The Mission will provide the strategic and comprehensive implementation effort to match the level of ambition, through research and innovation, increased and focused funding as well as citizen and stakeholder engagement. It will federate efforts across programmes and instruments, across sectors and at EU, national, regional and local level, ranging from research and innovation to deployment, investment and regulation. It will mobilise on a broad basis, engaging the European public to help catalyse the necessary transformative change for the restoration of the ocean and waters. The Mission will empower European citizens to help preserve one of their most precious common goods. It will address the fragmentation of research disciplines and knowledge systems, the need to structure efforts across governments, boundaries and water bodies. This integrated approach will restore the ocean and waters by addressing the many connected and cumulative pressures on their health in a coherent and efficient manner. The European Green Deal relies on mastering that challenge. As this Commission approaches its mid-term, **delivery on the European Green Deal** will become the main focus. The Mission will support that delivery effort.

How will success be measured? The Mission will have been accomplished if the quantified and measurable targets of the EU Biodiversity Strategy 2030¹⁵, EU Action Plan Towards Zero

¹⁵ COM(2020) 380 final. EU Biodiversity Strategy for 2030 – Bringing nature back into our lives: (i) Legally protect a minimum of 30% of the EU's sea area and integrate ecological corridors, as part of a true Trans-European Nature Network, (ii) Strictly protect at least 10% of the EU's sea area (iii), at least 25,000 km of free-flowing rivers are restored, (iv) nature restoration targets (to follow)

Pollution for Air, Water and Soil¹⁶ and the European Climate Law¹⁷ have been met by 2030 in the EU ocean, seas and waters. Moreover, the implementation progress of existing EU legislation will provide a measure for the success of the Mission. For example, under the Marine Strategy Framework Directive, reaching Good Environmental Status, where possible based on quantitative assessments, will enable the verification of the successful implementation of measures (see sections 1.3, 6). The possible future revision of existing legislation and the possible development of new legislations related to the Mission activities will also be a measure of impact.

R&I content? The Mission will **innovate and restore**. Innovation and restoration will be the twin levers, inseparably linked, to preserve our hydrosphere and the vital functions it supports. The Mission will develop and demonstrate at basin scale technological, social, business and governance innovation, environmental monitoring and knowledge systems. It will move from piloting to demonstration, deployment and market entry of innovative solutions over the course of the Mission's phases. The Mission will pilot and test ground-breaking research and innovation to map, monitor, protect and restore biodiversity under adverse climate change and anthropogenic pressures. Building on the excellence of EU research and innovation and European research infrastructures, it will regenerate the ocean and waters and reduce pollution through monitoring, assessment and then implementation of prevention, elimination and remediation measures from source to sea. It will deploy sustainable blue economy solutions for circularity and climate-neutrality, including technical solutions for the use of renewable energy in coastal areas and ports, actions for multi-use of the sea and water space, circular and zero-carbon aquaculture for low-impact food systems, and nature-based solutions for greenhouse gas emissions reductions and carbon sequestration (see sections 2.1, 2.2).

Buy-in? The Mission will support the implementation of key EU policy and regulatory initiatives for the ocean, seas and waters, mainly related to the *European Green Deal*. It will also contribute to *Europe fit for a Digital Age* and a *Stronger Europe in the World*, by driving the green and digital transitions across the ocean, seas and waters. It will connect, integrate and upscale solutions of various EU programmes and initiatives. The involvement of DGs CLIMA, CNECT, DEFIS, EAC, ENER, ENV, GROW, JRC, MARE, MOVE, NEAR, REGIO and RTD has been discussed and agreed by connecting, aligning and complementing programmes and activities. Member States have explicitly welcomed this Mission¹⁸, which will build on existing cooperation structures (e.g. sea basin conventions, multilateral research and innovation alliances, macro-regional strategies) between Member States, regions and third countries around major sea and river basins. Discussions to secure such cooperation are underway (see sections 2.1, 4, 5).

Budget? Different funding sources will be mobilised for the different phases of the Mission. Specific contributions from different EU programmes have been discussed and are envisaged (incl. in-kind contributions). The R&I core centred on the lighthouses (see section 2.2) and enablers (see section 2.3) will be funded with specific funding from Horizon Europe

¹⁶ COM(2021) 400 final. Pathway to a Healthy Planet for All – EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil': (i) Reduce by at least 50% plastic litter at sea, (ii) reduce by at least 30% microplastics released into the environment, (iii) reduce by at least 50% nutrient losses, the use and risk of chemical pesticides

¹⁷ Provisional agreement on the European Climate Law. <https://data.consilium.europa.eu/doc/document/ST-8440-2021-INIT/en/pdf>: (i) Reduce the EU's blue economy greenhouse gas emission reductions by at least 50% and towards 55% compared with 1990 levels.

¹⁸ Council conclusions of 26 May 2021 on a sustainable blue economy: health, knowledge, prosperity, social equity

(indicatively proposed budget: EUR 344.15m for 2021-23 incl. EUR 114.34m/2021, EUR 117.90m/2022, EUR 111.91m/2023). Sectoral programmes will co-fund the Mission (e.g. LIFE, EMFAF) and provide in-kind contributions (e.g. Copernicus, EMODnet). Mechanisms to interlink different programmes, including in shared management programmes (ERDF, ESF) and at EU level (InvestEU) will also be established. Beyond those EU contributions, the Mission will align with other public funding sources at national and regional level (including the Recovery and Resilience Plans).

Public-private and private funding will be crucial to achieve the Mission (and the European Green Deal) targets and the budget for the Mission provided by EU Programmes is estimated to leverage further. Private funding will be mobilised from several sources (risk capital, impact investment, philanthropic funding and funding from public development banks). The European Investment Bank has already agreed to cooperate with the Commission to increase its ambition and develop additional funding mechanisms in a core area of the Mission, reducing pollution.¹⁹ Discussions with private investors and banks, as well as with the European Bank for Reconstruction and Development are underway to develop investment solutions (see sections 3.1, 3.2).

¹⁹ <https://www.eib.org/en/press/all/2021-161-the-european-commission-and-european-investment-bank-group-join-forces-to-protect-the-oceans-and-boost-investment-in-the-sustainable-blue-economy>

1. Introduction

1.1. Problem definition

The EU's ocean, seas and waters are being degraded as a result of human activities. Progress in reaching good environmental status in the EU's marine waters has been slow and the 2020 targets of EU legislation (Marine Strategy Framework Directive) have not been met²⁰. Often, necessary data for assessing the state of the environment are not available²¹. Moreover, **the health of the marine waters is linked to the health of Europe's rivers and waters that flow into or are connected to the sea.** National assessments carried out under the Water Framework Directive (WFD) show that only 40% of Europe's surface water bodies achieve good ecological status, 46% of the European coastal waters fail to meet good ecological status and respectively 85% and 76% of the assessed coastal waters in the Black and Baltic Seas are in less than good status²². More than 65% of seabed habitats protected under the Habitats Directive are in unfavourable conservation status²³.

The degradation of marine and freshwaters is threatening the EU's natural capital, the essential goods and services that the water system provides and risks to perturb the self-regulatory characteristics of the water system beyond tipping points of no return. Many European commercial fish stocks are not in good status, according to the European Environmental Agency (EEA)²⁴. Many other aquatic species and habitats are vulnerable or endangered, or their status unknown²⁵. The deterioration of the ocean's health is reducing its capacity to act as a carbon sink. Globally, between 20% and 50% of coastal ecosystems have already been converted or degraded²⁶. As much as 1 billion tons of carbon dioxide are estimated to being released annually from degraded coastal ecosystems which had been stored there over decades²⁷. During the 20th century, the global mean sea level has risen by about 15 cm and could rise another metre this century²⁸. Extreme sea level events and floods both at the coast and from rivers are likely to occur more frequently by orders of magnitude²⁹, and will increasingly threaten Europe's communities and affect large sections of Europe's population as well as many more people globally³⁰.

²⁰ COM(2020) 259 final REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC)

²¹ <https://mcc.jrc.ec.europa.eu/main/dev.py?N=18&O=460>

²² EEA. 2018. European waters: Assessment of status and pressures 2018. Luxembourg: Publications Office of the European Union.

²³ EEA. 2020. State of the Nature in the EU. Luxembourg: Publications Office of the European Union

²⁴ <https://www.eea.europa.eu/data-and-maps/indicators/status-of-marine-fish-stocks-4/assessment>

²⁵ COM(2020) 259 final

²⁶ Hoegh-Guldberg, O., et al. 2019. "The Ocean as a Solution to Climate Change: Five Opportunities for Action." Report. Washington, DC: World Resources Institute.

²⁷ The Blue Carbon initiative. 2019. Mitigating climate change through coastal ecosystem management.

²⁸ IPCC 2019. Special Report on the Ocean and Cryosphere in a Changing Climate. In press.

²⁹ JRC. 2020. Adapting to rising river flood risk in the EU under climate change. Luxembourg: Publications Office of the European Union

³⁰ EEA. 2020. Global and European sea level rise: <https://www.eea.europa.eu/data-and-maps/indicators/sea-level-rise-7/assessment>

The degradation of Europe's marine and freshwaters is mainly driven by three interlinked factors³¹:

- 1. Unsustainable exploitation of marine and freshwater resources and land/sea use.**
In the Mediterranean and Black Seas, 75% of the commercially exploited fish and shellfish species are overfished (2018)³². Over 65% of protected seabed habitats are reported as being in unfavourable conservation status and 79% of the coastal seabed is considered to be physically disturbed, which is mainly caused by bottom trawling³³. According to the EEA, about 19 % of the EU coastline is affected by permanent physical alterations in seabed habitats due to urbanisation, port facilities, boating, flood protection infrastructures and land reclamation. Moreover, about 25 % of the area of the coastal strip is subject to seabed habitat loss due to construction of wind farms, oil and gas installations and ports, as well as exploitation of fish, shellfish and minerals³⁴. Barriers and dams alter the natural flow of rivers and disturb ecosystem connectivity and continuity, constituting a significant pressure for about 20 % of European surface water bodies³⁵. According to the 2020 State of Nature in the EU report, the proportion of wild bird species with poor and bad status has increased to 39% between 2013 and 2018, with 63% of non-bird species showing poor or bad status of which 35% are further deteriorating and only 15% of habitats assessments show a good status³⁶.
- 2. Pollution is affecting the water system from source to sea, notably plastics and microplastics, nutrients, chemicals and underwater noise.** Litter is particularly pervasive worldwide. Plastic pollution has increased tenfold since 1980 and each year between 4.8 and 12.7 million tonnes end up in the ocean³⁷ with microplastics becoming an increasing risk³⁸. The main driver of point source pollution is insufficient waste and urban wastewater treatment and storm overflow. Agriculture, on the other hand, is the major driver of diffuse pollution with the highest inputs of nutrients and organic matter into aquatic environments. Overall, only 38% of Europe's surface water bodies achieved good chemical status with mercury, PBDE and PAHs responsible for most of the failures to achieve good chemical status³⁹. Marine biodiversity is also affected by ship-source pollution to air and water. Underwater noise mainly from shipping traffic and from impulsive sources adversely affects the health of marine species and biological productivity⁴⁰.

³¹ IPBES. 2019. *Global assessment report on biodiversity and ecosystem services* of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. IPBES secretariat, Bonn, Germany, 2019.

³² FAO. 2020. *The State of Mediterranean and Black Sea Fisheries 2020*. General Fisheries Commission for the Mediterranean. Rome

³³ COM(2020) 259 final

³⁴ EEA. 2019. *The European environment - State and outlook 2020: Knowledge for transition to a sustainable Europe*. Luxembourg: Publications Office of the European Union.

³⁵ EEA. 2021. *Tracking barriers and their impacts on European river ecosystems*.

³⁶ EEA. 2020. *State of the Nature in the EU*. Luxembourg: Publications Office of the European Union

³⁷ Jambeck, J. et al. 2015. "Plastic waste inputs from land into the ocean", *Science*, Vol. 347(6223): pp. 768-771.

³⁸ Group of Chief Scientific Advisors. 2019. *Environmental and Health Risks of Microplastic Pollution*. Luxembourg: Publications Office of the European Union.

³⁹ EEA. 2018. *European waters: Assessment of status and pressures 2018*. Luxembourg: Publications Office of the European Union.

⁴⁰ OSPAR. 2017. <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/pressures-human-activities/distribution-reported-impulsive-sounds-sea/>

3. **Human-induced climate change is altering the physical and biological state of the ocean, seas and waters and disturbing their ecosystems**⁴¹. Increased carbon dioxide emissions and their subsequent absorption by the ocean and waters lead to changes in water temperature, ocean acidification and deoxygenation, leading to changes in oceanic circulation and chemistry, rising sea levels, increased storm intensity, flooding, as well as changes in the diversity, distribution and abundance of marine species. Since the beginning of the Industrial Revolution, the acidity of the ocean has increased by 30 percent⁴². Ocean acidification decreases plankton weight, dissolves calcareous shells and harms corals. Both acidification and warming affect the availability and toxicity of several chemicals, leading to cumulative effects of multiple stressors on organisms and ecosystems. Temperatures of rivers and lakes rise, which makes them hostile to cold-water fish, causing the formation of dead zones. Due to heavy rainfall, the flow of rivers rapidly and frequently changes from the lowest to the highest levels, which disturbs the comfort of plant life and animal reproduction⁴³. Changes in ocean temperatures and currents brought about by climate change are leading to alterations in climate patterns in Europe and around the world. Live ecosystems are affected by these changes, modifying migratory patterns and generating habitat loss. Longer drought periods, as experienced in recent years, as well as more frequent heavy rainfall events, pose new challenges to freshwater management with competition for available water resources increasing. Climate change weakens the ability of the ocean and coasts to provide critical ecosystem services such as food, carbon storage, oxygen generation, as well as to support nature-based solutions to climate change adaptation whereas changes in water bodies cause them to emit more methane⁴⁴. Moreover, harm to the seabed and the destruction of important sea habitats further release carbon into the atmosphere, accelerating climate change.

To restore the hydrosphere's health and its essential functions and services, its degradation must be reversed. To reverse the degradation, all the interlinked principal drivers – unsustainable exploitation, pollution and climate change as well as lack of citizen engagement and insufficient knowledge – need to be addressed in a systemic manner along the whole water system. All those drivers, and the solutions to tackle them, are inseparably linked.

1.2. Mission specific objectives and targets

The objective of the Mission is to restore the health of the EU's ocean and waters by 2030. Specifically, this Mission's objective is to restore the health of our ocean and waters by reaching the European Green Deal targets for biodiversity, zero pollution and decarbonisation with greenhouse gas emissions reduction for 2030, across the ocean, seas and waters, thereby addressing the three principal drivers of degradation.

The Mission will have been accomplished if the following interlinked specific objectives and targets have been met by 2030:

⁴¹ IPCC 2019. *Special Report on the Ocean and Cryosphere in a Changing Climate*. In press.

⁴² <https://www.eea.europa.eu/data-and-maps/indicators/ocean-acidification-3/assessment>

⁴³ Havens, K. Jeppesen, E. 2018. "Ecological Responses of Lakes to Climate Change", *Water* Vol 10(7): p. 917.

⁴⁴ Rosentreter et al. 2021. "Half of global methane emissions come from highly variable aquatic ecosystem sources", *Nature Geosciences* Vol. 14: pp. 225–230.

1. **Protect and restore marine and freshwater ecosystems and biodiversity, in line with the EU Biodiversity Strategy 2030⁴⁵:**
 - a. Protect a minimum of 30% of the EU's sea area and integrate ecological corridors, as part of a true Trans-European Nature Network.
 - b. Strictly protect at least 10% of the EU's sea area.
 - c. Restore at least 25,000 km of free-flowing rivers.
 - d. Contribute to relevant upcoming marine nature restoration targets⁴⁶ including degraded seabed habitats and coastal ecosystems.⁴⁷
2. **Prevent and eliminate pollution of our ocean, seas and waters, in line with the EU Action Plan Towards Zero Pollution for Air, Water and Soil⁴⁸:**
 - a. Reduce by at least 50% plastic litter at sea.
 - b. Reduce by at least 30% microplastics released into the environment.
 - c. Reduce by at least 50% nutrient losses, the use and risk of chemical pesticides.
3. **Make the sustainable blue economy⁴⁹ carbon-neutral and circular, in line with the proposed European Climate Law⁵⁰ and the holistic vision enshrined in the Sustainable Blue Economy Strategy:**
 - a. Eliminate greenhouse gas emissions from maritime economic activities in the EU and sequester those emissions that cannot be avoided (net zero maritime emissions).
 - b. Develop zero-carbon and low-impact aquaculture, and promote circular, low-carbon multi-purpose use of marine and water space.

By the end of the first phase of this Mission, these targets will be reviewed to determine where the Mission can go even further.

1.3. Delivering on key EU policies

The Mission will deliver on key EU policy and regulatory initiatives and work in synergy with other ongoing initiatives. This Mission will provide an innovation push that will enable a better implementation of existing regulations, including a better monitoring of their implementation, notably of the *Common Fisheries Policy*, the *Marine Strategy Framework Directive* and the *Water Framework Directive*. Moreover, the Mission will provide solutions allowing for a higher level of ambition in future revisions of key policies and for the development of new legislation, where relevant (e.g. the new Arctic policy).

Specifically, this Mission will support three key and interlinked European Green Deal transitions by demonstrating and rolling out innovative solutions across the European Union:

⁴⁵ COM(2020) 380 final. EU Biodiversity Strategy for 2030 – Bringing nature back into our lives.

⁴⁶ The Mission will also be linked to the forthcoming nature restoration targets for the marine environment, as announced in the EU Biodiversity Strategy for 2030.

⁴⁷ As proposed by the Mission Board Healthy Oceans, Seas, Coastal and Inland Waters. 2020. *Mission Starfish 2030: Restore our Ocean and Waters report*. Publication Office of the EU: Luxembourg

⁴⁸ COM(2021) 400 final. Pathway to a Healthy Planet for All – EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' NB: All these targets are subject to a review by 2025.

⁴⁹ COM/2021/240 final. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future.

⁵⁰ COM(2020) 80 final. Proposal for a Regulation establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law).

- i. **Protecting and restoring marine and freshwater ecosystems and biodiversity** will not only help implement the *EU Biodiversity Strategy for 2030* and its forthcoming nature restoration targets in 2021, but also contribute to the implementation of EU environmental legislation and the *Common Fisheries Policy*. This includes scaling up of nature-based solutions which will improve the resilience of our communities to e.g. sea level rise, floods, droughts and coastal erosion, contributing to the *EU Strategy on Adaptation to Climate Change*⁵¹.
- ii. **Reducing pollution across the hydrosphere will** help to achieve the ambition of the *Zero Pollution Action Plan for Air, Water and Soil*. The upstream prevention, elimination, remediation and monitoring of pollution will also contribute to the *Water Framework Directive*⁵², *Marine Strategy Framework Directive*⁵³, *Circular Economy Action Plan*⁵⁴, the *EU Strategy for Plastics in the Circular Economy*⁵⁵, the *EU Chemicals Strategy for Sustainability*⁵⁶, the *European Bioeconomy Strategy*⁵⁷ including its 2022 Progress Report, the *Urban Waste Water Treatment Directive*⁵⁸ as well as to the implementation of a number of policy instruments of the *Barcelona Convention*, such as the Regional Action Plan against marine litter, to be updated in 2021. The Mission will also contribute to improving International Ocean Governance and will follow up on the international work ongoing in this area.
- iii. **Making the sustainable blue economy carbon-neutral and circular**, in line with the *European Climate Law*⁵⁹ emissions reduction target for 2030 and climate-neutrality by 2050. It will mobilise the ocean's and inland water's potential for carbon-free energy, which must be scaled up at unprecedented pace in less than a decade. It will contribute to implementing the *Sustainable Blue Economy Strategy*⁶⁰, the *Marine Spatial Planning Directive*⁶¹, the *EU Offshore Renewables Energy Strategy*⁶², the *EU Smart and Sustainable Mobility Strategy*⁶³, the *EU Strategy on Energy System Integration*⁶⁴, the *EU Hydrogen Strategy*⁶⁵ and the *EU Farm to Fork Strategy*⁶⁶. All the aforementioned face decisive implementation challenges in maritime and inland water areas (including synergies with the creation of Emission Control Areas for cleaner and zero emission shipping) considering the different users of the ocean and seas.

The Mission will aim to **accelerate the twin green and digital transition** across EU marine and freshwaters, and contribute to making the central priorities of the **European Green**

⁵¹ COM(2021) 82 final

⁵² Directive 2000/60/EC

⁵³ Directive 2008/56/EC

⁵⁴ COM(2020) 98 final

⁵⁵ COM(2018) 28 final

⁵⁶ COM(2020) 667 final

⁵⁷ European Commission. 2018. *A sustainable bioeconomy for Europe: strengthening the connection between economy, society and environment*. Luxembourg: Publications Office of the European Union.

⁵⁸ Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment

⁵⁹ Provisional agreement on the European Climate Law. <https://data.consilium.europa.eu/doc/document/ST-8440-2021-INIT/en/pdf>

⁶⁰ COM(2021) 240 final

⁶¹ Directive 2014/89/EU

⁶² COM(2020) 741 final

⁶³ COM(2020) 789 final

⁶⁴ COM(2020) 299 final

⁶⁵ COM(2020) 301 final

⁶⁶ COM(2020) 381 final

Deal and A Europe Fit for the digital age a reality in the EU. The solutions developed and deployed will assist regions and local communities with their *Smart Specialisation Strategies*, promoting transformation across Europe's coastal communities and beyond, and ensuring a just and fair transition leaving no one behind. Moreover, the Mission will aim to **strengthen the EU's position as a global leader for ocean and water sustainability**, in line with the *European Neighbourhood Policy*, the *Global Approach to Research and Innovation*⁶⁷, a *new EU-US agenda for global change*⁶⁸. It will operate in synergy with the forthcoming revisions of the *EU Arctic Policy* and the *International Ocean Governance agenda*.

1.4. Delivering on the Sustainable Development Goals

As outlined in the Mission Starfish 2030 report⁶⁹, the Mission will support many Sustainable Development Goals. Restoring our ocean and waters will directly contribute to SDG 14 Life below water and SDG 6 Clean water and sanitation. Restoring our ocean and waters will interact and indirectly support most of the other SDGs (see Figure 1 for illustrative relation between SDG14 and other SDGs).

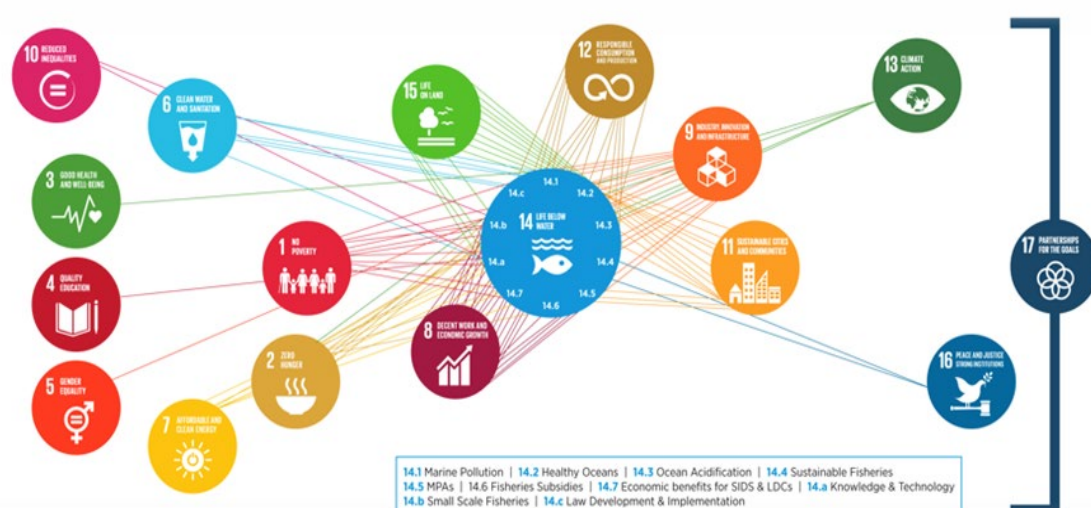


Figure 2 Link between SDG14 and other Sustainable Development Goals⁷⁰

Amongst other, the hydrosphere plays a central role in the Earth and climate system, thus affecting climate action (SDG 13) and life on land (SDG 15). Healthy ecosystems provide food security (SDG 2) and sustain livelihoods (SDG 1). A decarbonised blue economy can provide affordable and clean ocean energy (SDG 7), foster circular and responsible production and consumption patterns (SDG 12), thus improving the sustainability of cities and communities (SDG 11) and providing decent work and economic growth (SDG 8). Moreover, the Mission will provide strong innovation (SDG 9) and quality education (SDG 4) and global partnership for sustainable development (SDG 17).

⁶⁷ COM(2021) 252 final

⁶⁸ JOIN(2020) 22 final

⁶⁹ Mission Board Healthy Oceans, Seas, Coastal and Inland Waters. 2020. Mission Starfish 2030: Restore our Ocean and Waters report. Publication Office of the EU: Luxembourg

⁷⁰ Schmidt et al. 2017. "Conserve and sustainably use the oceans, seas and marine resources for sustainable development" in International Council for Science, 2017. A Guide to SDG Interactions: from Science to Implementation. International Council for Science: Paris

1.5. Implementing the Mission based on the Starfish 2030 Report

This Mission Implementation Plan builds on the robust analysis of the Mission Board Report “Mission Starfish 2030”, which outlines the fundamental importance of the water system and the need for a systemic, comprehensive approach for its restoration, linking freshwater and marine elements. This Mission reflects the overall ambition of restoring our ocean and waters, and mirrors the five overarching objectives proposed by the Mission Board. This Implementation Plan reflects the five “legs” of the Starfish. These are translated into the three specific objectives and two enablers, which are closely interrelated and mutually supportive.



Figure 3 From the Mission Starfish 2030 Report to Mission specific objectives and enablers

The Implementation Plan takes up the Mission Board’s three substantive objectives for restoring our ocean and waters (“regenerating marine and freshwater ecosystems; zero pollution; decarbonising our oceans, seas and waters”). It combines those objectives with the 2030 agenda and political ambition set out by the *von der Leyen* Commission in its European Green Deal (EU Biodiversity Strategy; Zero Pollution Action Plan; Climate Law) which is broadly congruent with the “Starfish” report’s ambition.

The Implementation Plan also takes up the Mission Board’s objective to “fill the knowledge and emotional gap”, by proposing *enabling actions* (section 2.3 of this plan), in particular by creating a digital knowledge system and promoting public mobilisation, engagement and awareness. Participatory governance is a central feature of this Mission with co-design and co-implementation of solutions with citizens and stakeholders at its heart. All actions under this plan, both the lighthouses and the scale-up actions will forge long-term connection and integration of European, national, regional and third countries and their activities, taking up some of the Mission Board’s proposals for a revamped ocean and water governance.

While most of the targets are incorporated in this implementation plan, a few specific targets proposed by the Mission Board for specific blue economy sectors are not directly addressed, as they are either already covered by other EU policies or ongoing initiatives, or because they would spread the limited Mission resources too thinly to be impactful.

This Implementation Plan focuses on the criteria under which the Commission will assess the proposed Mission and on activities eligible under its legal basis in the Horizon Europe Regulation⁷¹. The Starfish 2030 Report goes further in making a number of suggestions for

⁷¹ COM(2018) 435 final

regulatory initiatives through European Union legislation (for instance, to regulate underwater noise, to ban micro-plastics, to revise the EU Maritime Spatial Planning Directive). The Mission will make an important push to implement current legislation. On that basis, and when reviewing progress after phase 1, the Commission and European Institutions may consider the case for further regulation. The Mission will provide the knowledge and the context for the necessary consultations and contribute to impact assessments. The Mission will contribute to upcoming reviews of relevant policies (e.g. review of the Marine Strategy Framework Directive, report on the Maritime Spatial Planning Directive, Water Framework Directive, LULUCF Regulation) and in the development of new ones (e.g. legally binding EU nature restoration targets, follow up to the Single Use Plastics Directive⁷²).

The high ambition of the Mission requires **strong and effective governance** to steer cooperation between different actors to reach the Mission's objectives. Following the Mission Board's recommendations, an integrated and participatory EU system of ocean and water governance is proposed, featuring continuous engagement with institutional partners and citizens (see section 2.3.2) and a **Forum** with the participation of citizens. This flagship event will allow for discussion on Mission progress including delivery of objectives across the EU and implementation of Mission lighthouses (see section 5.1). The new approach for a sustainable blue economy in the EU⁷³ addresses a number of the Mission Board's proposals for a more integrated EU system of ocean and water governance. Furthermore, the Mission Board makes a number of recommendations on governance that involve different EU Institutions (the European Council, Parliament, Council - see section 5.1).

EU leadership on effective **global ocean governance** is also encouraged in the Mission Starfish report. The EU must make ocean regeneration and governance one of its strategic priorities (see section 5.3). As the world's leader on ocean sustainability, the EU values and promotes joint efforts built on multilateralism and a rules-based international order – within and beyond Europe. Already in 2016, the EU was the first jurisdiction in the world to develop an International Ocean Governance (IOG) Agenda. The Mission Board's recommendations on international governance overlap with the European Commission's present and future IOG agenda.

In 2020, the International Ocean Governance Forum (IOG Forum) convened by the EU, a body that assembles stakeholders in international ocean governance, published key recommendations⁷⁴ for action. These recommendations encourage the EU to continue to lead by example to champion in tackling ocean degradation and lead a global ocean conservation strategy. Promoting a "whole-of-ocean-governance" approach to fight climate change is a further outcome of this process. All five "Starfish" building blocks are reflected in the recommendations. The Commission will produce an **updated IOG Agenda in 2022** in response to these IOG Forum recommendations. The updated IOG Agenda will be the cornerstone upon which the future of ocean governance will be collectively built with all international partners, taking shared responsibility for the ocean as a vital global public good, as reflected in the inclusive process of the IOG Forum.

⁷² See Article 15 evaluation and review process for Directive (EU) 2019/904.

⁷³ COM(2021) 240 final

⁷⁴ <https://3rd-iog-forum.fresh-thoughts.eu/wp-content/uploads/sites/89/2021/04/IOG-recommendations-2021-WEB.pdf>

2. Implementation of the Mission

2.1. Intervention logic and timing

This Mission will provide a systemic approach for the restoration of our ocean and waters, following the overarching logic as set out in the Mission Starfish 2030 report⁷⁵. This systems approach comprises the following elements, which the Mission will deliver:

1. Set-up of **‘lighthouses’** for the major European sea and river basins, based on existing structures, as the Mission sites to promote basin-wide cooperation, commitment and deployment of solutions addressing the three Mission’s objectives.
2. A core of scalable and replicable, excellent and impact-driven **research and innovation solutions** (technological, business, social and governance) and **demonstration** activities tailored specifically for each of the three specific Mission objectives.
3. **Scale up projects** throughout European sea and river basins to achieve the Mission objectives and targets;
4. A **digital ocean and water knowledge system** including an environmental and biodiversity monitoring system to better understand, monitor and forecast the health of the water system as a whole and measure progress towards the targets of this Mission.
5. **Public mobilisation and engagement:** with tried and tested deliberative democracy mechanisms and social innovation practices, participatory governance approaches, mobilising and empowering citizens for the co-design and co-implementation of solutions.

⁷⁵ Report from the Mission Board “Healthy Oceans, Seas, Coastal and Inland Waters”.

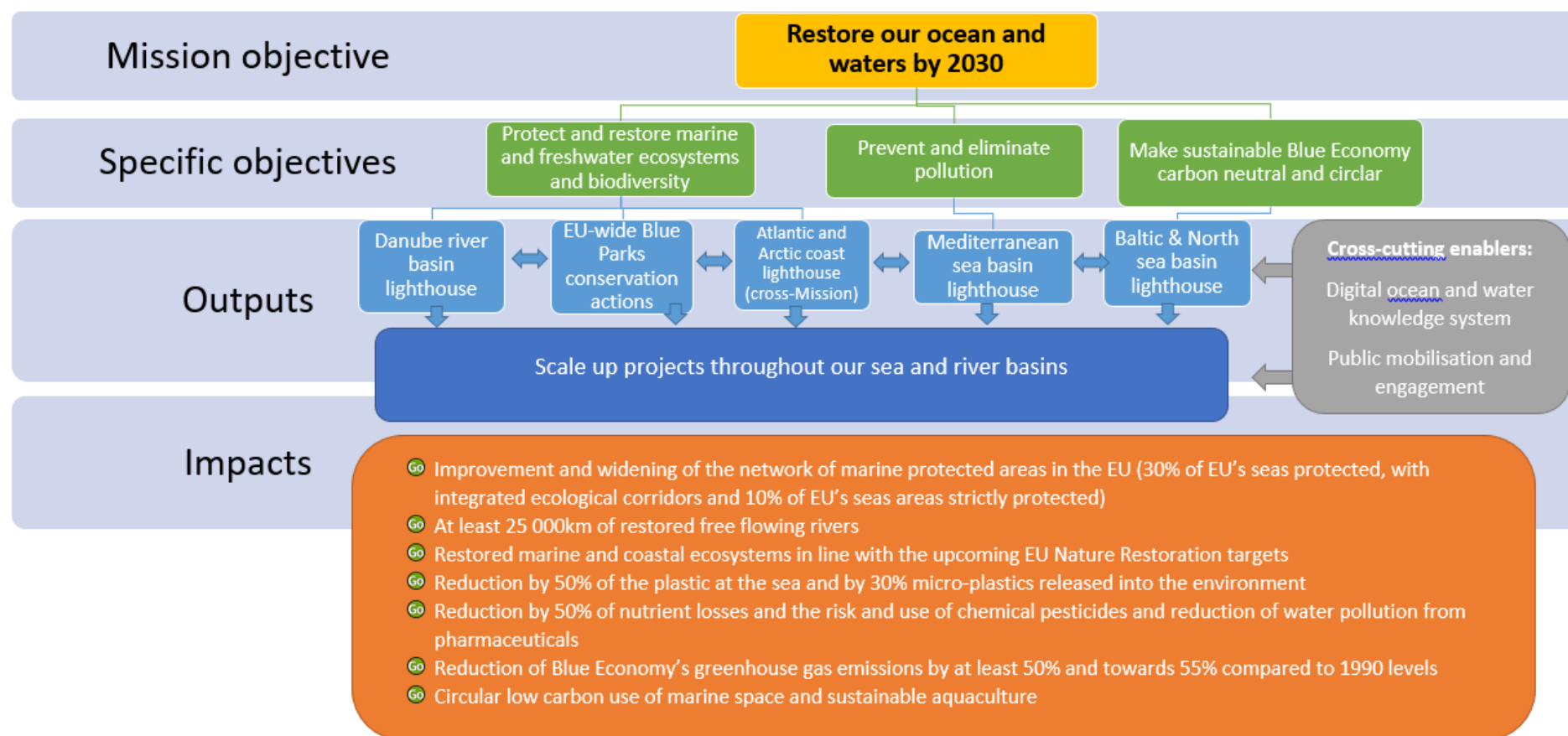


Figure 4 Mission Intervention Logic (detailed outcomes are set out in Sections covering each specific target)

2.1.1. Mission phases

The Mission will be implemented in two phases. In the first ‘**development and piloting**’ phase (2022-2025), foundations will be laid for the implementation of the three Mission objectives and enabling actions. Important excellent and impact-driven research and innovation actions will be carried out in the first phase. In particular, new transformative solutions will be piloted and tested for ecosystem restoration, for reducing pollution and for developing circular and carbon neutral blue economy activities. This will be complemented by new knowledge and data for monitoring and forecasting services, methodologies and pilots for biodiversity mapping, and new frameworks for citizen science and engagement, training and education. Mission ‘**lighthouses**’ will be launched in the first phase, as **sites to pilot, demonstrate and deploy** the Mission solutions across EU sea and river basins **as well as mobilise** Member States, regions and other relevant actors to address common challenges collectively.

In the **second ‘deployment and upscaling’ phase** (2026-2030), the solutions developed and piloted in the first phase to deliver on the Mission and Green Deal objectives will be further deployed, replicated and scaled up through rounds of open calls for scale up actions. This will enable broad participation in the Mission across the EU. These scale up actions will bring new innovations and technologies developed in the first phase to higher TRL levels, and de-risk their market deployment, and adapt solutions so they can be replicated in new areas. These scale up actions will have a strong citizen, stakeholder and community governance element. The ‘lighthouses’ will continue implementing the objectives and developing further solutions needed for scale up, supported by strengthened basin-scale cooperation and governance. Furthermore, the digital knowledge, monitoring and forecasting services will be implemented at a large scale. Citizen participation, training, education, citizen science and engagement will continue to support the delivery of the Mission by 2030. Excellent and impact-driven R&I efforts will continue also in the second phase, in particular by boosting the scale, scope and availability of the knowledge and data, improving monitoring and forecasting services, DNA sequencing, and mapping and modelling of biodiversity in a context of climate change and anthropogenic pressures. The development of new business models, financial and societal innovation as well as innovative participatory research frameworks with close involvement of citizens will also continue in the second phase.

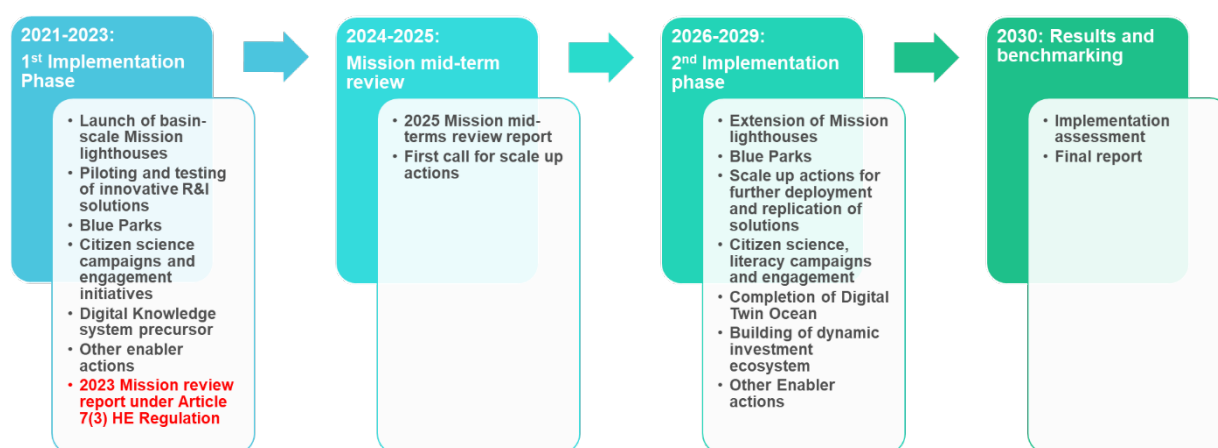


Figure 5 Overview of the Mission implementation schedule and milestones

2.1.2. Mission lighthouses

As a first step, the Mission will roll out ‘lighthouses’ as sites piloting, demonstrating and deploying the Mission activities across EU sea and river basins. Building on existing

initiatives, and different sources of funding, starting with Horizon Europe, but not limited to this (see section 3), these lighthouses will cover all seas bordering the EU as well as major river basins, i.e. the Atlantic and Arctic coast, Baltic and North Sea, Mediterranean Sea and Danube River basin (see below). Due to the transboundary nature of waters, basin-scale coordination of implementation and regional cooperation is required for solutions to be effective for resolving shared problems. Lighthouses will act as hubs and platforms for the development and deployment of transformative innovations of all forms – technological, social, business, governance – and integrate existing knowledge outputs and new knowledge, ensuring local business participation and citizen engagement and outreach. They will be selected and implemented through **calls for proposals** following the Horizon Europe principles of R&I excellence, competition, and impact-driven research and innovation, which will draw on the best expertise and R&I capabilities from across the EU. That excellence-driven and competitive approach will ensure societal impact and fast progress towards the achievement of Mission objectives in the river and sea basins through science and technology. While covering each of the EU sea and water basins, these lighthouses will include and engage all EU regions.

The lighthouses governance will be built on existing basin level governance structures and established through an **implementation charter** concluded among the Member States, regions and the European Commission, and where relevant third countries and other stakeholders. The charter will politically commit the partners at ministerial level to cooperating, aligning and mobilising resources to achieve the three Mission specific objectives, building on and bringing together existing governance structures and networks in the basin. The charter will involve stakeholders and citizens in the basin using an inclusive, bottom-up and participatory process with special attention paid to disadvantaged and less developed areas to ensure cohesion across the basin and leaving no region or community behind (for detail on governance see section 5.). The Implementation charter will be supported by baseline studies to map the basin needs and specific basin-relevant measures for the lighthouse within Mission objectives, including specific R&I targets.

To gain initial traction and deliver results quickly, different **lighthouses will pilot and lead on one of the Mission objectives**, capitalizing on established activities and programmes (R&I, space, maritime, environmental, regional etc.) and delivery models (e.g. maritime strategies, assistance mechanisms, etc.). Importantly, the lighthouses will be guided by the principles of **replicability**⁷⁶ and **EU-wide scalability**. The lighthouses will thus provide access to the solutions, services and advice developed not only in their basin, but also to all interested actors from other basins and areas, so that the developed solutions can eventually be scaled up and replicated across the Union.

⁷⁶ The replicability principle entails not only technical replicability but also transferability into other environmental, societal and institutional conditions.

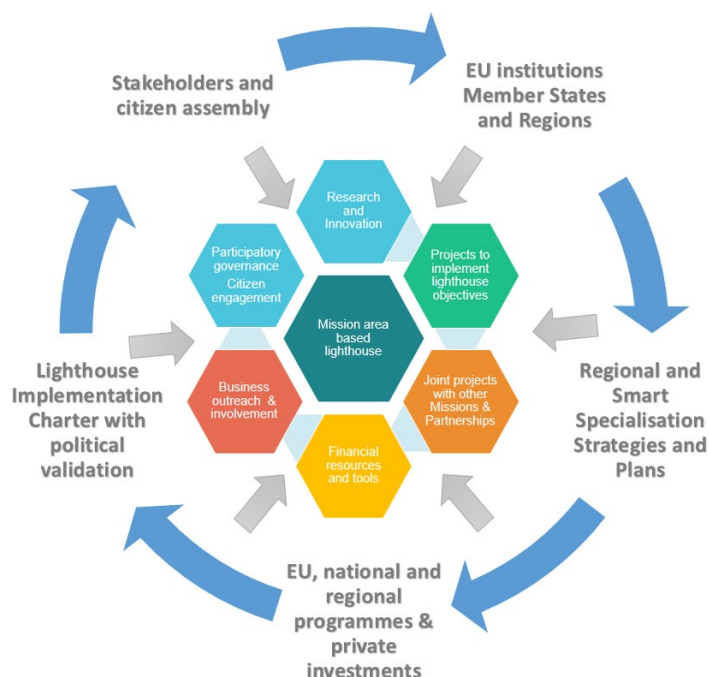


Figure 6 Main elements of the Mission lighthouses

The following lighthouse areas were identified to pilot specific objectives, in view of (i) achieving a territorial coverage involving all Member States; (ii) covering the main elements of the water system, working with naturally coherent and continuous areas/ecosystems (sea and river basins) and covering all three Mission objectives; (iii) building on prior political commitments for basin-scale cooperation and existing capacities and networks.

Leadership on Mission objectives	Lighthouse area	Selected existing networks
Protect and restore ecosystems and biodiversity (freshwater)	Danube river basin	Macroregional strategy for the Danube river basin ⁷⁷ International Commission for the Protection of the Danube river ⁷⁸
Protect and restore ecosystems and biodiversity (marine)	Atlantic and Arctic coast	All-Atlantic Ocean Research Alliance, Atlantic Action Plan 2.0, OSPAR, Copernicus global, NWS ⁷⁹ and IBI ocean monitoring and forecasting centres
Prevent and eliminate pollution	Mediterranean Sea ⁸⁰	Union for Mediterranean, BlueMed initiative incl. Pilot for a healthy, plastic-free Mediterranean ⁸¹ , UNEP-MAP (Barcelona Convention), PRIMA, Western Med sea-basin strategy, Copernicus Black-Sea and Med Sea Ocean monitoring and forecasting centres

⁷⁷ See [EUSDR](#) – In particular priority areas 4 (water quality) and 6 focusing on biodiversity.

⁷⁸ See [ICPDR](#) – International Commission for the Protection of the Danube River and the 1994 Convention on Co-operation for the Protection and Sustainable Use of the River Danube.

⁷⁹ North West Shelves, Iberian-Biscay-Ireland basins addressing the Atlantic

⁸⁰ The Mediterranean Sea also has important links to the Black sea.

⁸¹ Since 2018, 16 Mediterranean countries have joined forces under the BlueMed pilot for a healthy, plastic-free Mediterranean Sea to tackle marine litter and have set up national hubs to tackle plastic pollution. These hubs have (i) mapped ongoing actions and initiatives (ii) developed a digital platform to share best experiences (iii) mobilised a broad partnership to implement the pilot in the Mediterranean Sea: <http://www.blumed-initiative.eu/pilot-action-on-a-healthy-plastic-free-mediterranean-sea/>

Make the blue economy carbon-neutral	Baltic and North Sea basin	HELCOM ⁸² , OSPAR, Bonus Art. 185, BANOS Baltic and North Sea Co-operation, EU Strategy for the Baltic Sea Region, Copernicus, Arctic and Baltic ocean Monitoring and forecasting centre
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Basins entail larger naturally, economically, societally, culturally and politically interconnected areas comprising multiple regions (as administrative entities) and extending over multiple Member States or associated countries along a river, or a sea. They represent naturally coherent and continuous areas of appropriate scale and interconnectedness to tackle the multiple and mutually interconnected challenges of the ocean, seas and waters. Existing political, scientific, regional and cultural cooperation, strategies and legal instruments, such as international conventions and agreements are therefore centred on river and sea basins, as outlined in the above table.

The Mission lighthouses within the basins and their regions will be selected and implemented in particular via competitive calls open all relevant actors throughout the EU as well as in associated countries, where relevant and as appropriate. Particular attention will be paid to the coordination and coherence of the Mission lighthouse portfolios and other local, regional and national efforts at the basin scale, with the view to ensuring maximum cohesion in the achievement of the Mission objectives at basin scale, in line with the European Green Deal principle of leaving no one behind.

By 2030, all the lighthouses will address all three Mission objectives and deliver concrete outcomes for each of them. To support their implementation, the Mission will fund scalable and replicable research and innovation solutions for each of the three objectives, and put in place digital knowledge systems, connected public governance and a dynamic investment ecosystem.

2.1.3. Mission scale-up actions

Scale up actions for all three Mission objectives will be implemented from 2026 at the latest, following a mid-term review of the Mission. The scale up actions will support moving R&I outcomes in particular those from the first phase to higher TRL levels, to ensure effective market entry and accelerate the introduction of new solutions and technologies, using EU funds under shared management, co-funding and mobilised private investments (see section 3).

The scale-up actions would be implemented through **calls launched on an annual basis as of 2025** to macroregions, regions and communities for expression of interest in becoming Mission scale up sites. These calls will result in a preselection of regions based on criteria involving project objectives, scale and ambition, citizen and stakeholder involvement, institutional and governance readiness and financial and other resources committed to the project from different private and public sources⁸³.

As a next step, a **baseline study** will be conducted for each selected region to determine the situation and needs of the region and scale up project focus and activities. Simultaneously,

⁸² 1974 Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention) set up the Baltic Marine Environment Protection Commission (Helsinki Commission, HELCOM). The Helsinki Convention seeks to protect the Baltic Sea from all sources of pollution from land, air and sea, as well as to preserve biological diversity and to promote the sustainable use of marine resources.

⁸³ The methodological framework and assessment criteria for the selection of scale up projects will be developed based on the 2021 Horizon Europe Work Programme, which includes this topic for the candidate Mission ocean, seas and waters.

synergies with regional and Smart Specialisation Strategies will be explored, with technical assistance from the JRC.

On that basis **an agreement with scale up host region/community** will be concluded, defining the scale up project and setting up its implementation timeline. The agreement will enable the region/community to receive knowledge and technical assistance of the one stop shop Mission Implementation Platform. This will be followed by the implementation of the scale up project under a continuous and dynamic progress monitoring with clear milestones.

2.2. Specific objectives⁸⁴

2.2.1. Objective 1: Protect and restore marine and freshwater ecosystems and biodiversity

Outputs: The Mission will launch two basin scale restoration lighthouses: in the **Danube river basin** and on the **Atlantic and Arctic coast**. **The Mission will also launch an EU-wide “Blue Parks” platform to promote conservation, protection and active restoration of sea areas.**

The **two basin scale lighthouses** will demonstrate that restoration of aquatic ecosystems is possible at large scale through reduction of pressures (e.g. from fishing, pollution, extraction, barriers such as dams and weirs, inland ships and other human activities), ecosystem-based management, and effective nature-based restoration measures including blue reforestation to boost coastal resilience to climate change impacts.

The **Atlantic and Arctic lighthouse** will make the most of cross-Mission synergies, by targeting **marine ecosystem restoration** in coastal communities particularly vulnerable to the risks of sea level rise that urgently need to adapt to ensure their population and infrastructure is safe, climate-proof and weather-resilient. Sea level rise is likely to negatively **affect coastal biodiversity**, through salinisation of natural areas and groundwater, ecosystem destruction and increased pollution. The lighthouse will thus develop, **test and implement nature-based solutions to boost coastal resilience through restored and resilient coastal ecosystems**, such as oyster reefs, kelp forests, wetlands and salt marshes within the area of the cities and communities. The cross-Mission lighthouse will be shared with the **Mission Adaptation to Climate Change** for coastal flood management, nature based solutions, climate proofing of critical infrastructure, **Mission Soil Health and Food** for prevention of agriculture pollution and salinisation of groundwater, **Mission Climate-neutral and Smart Cities**, using nature-based solutions as carbon sinks to contribute to the climate-neutrality of coastal cities and communities. Its activities will also have an international impact, reinforcing existing Atlantic and Arctic international collaboration initiatives in the basin. This includes the All-Atlantic Ocean Research Alliance, with its “pole-to-pole” scope covering the Arctic to Antarctica.

The Mission will also launch an EU-wide **‘Blue Parks’ platform**. **This platform will provide the scientific basis and underpinning for the expansion of networks of marine protected areas,**

⁸⁴ The outputs and outcomes provided in each of the objectives are final. The indicators to be developed by 2022 as a part of the comprehensive Mission monitoring system outlined in section 6 below are not intended to add additional outputs and outcomes but merely to ensure that the monitoring is based to the largest extent possible on existing indicators provided for in the existing monitoring systems for the relevant EU legislation, complemented where necessary for specific outcomes of the Mission, and that composite indicators needed for each objective follow sound methodologies.

by mapping EU marine biodiversity and assessing coherence of their networks. It will support their active and passive restoration and effective management through innovative approaches to assessing and managing the most important pressures. It will provide technical assistance to local and regional protection and restoration initiatives to improve governance and facilitate dialogue with all local stakeholders and social innovation. It will rely on the digital knowledge system for access to data, monitoring and forecasts and knowledge dissemination. The platform will link protection efforts and protected areas in the EU with relevant international protection efforts (e.g. in Antarctica⁸⁵).

Research and innovation: Drawing on the Horizon 2020 Green Deal Call and on first topics of Horizon Europe Cluster 6 on MPA & MSP and socio-ecological management, the Mission will deliver: **Knowledge:** building on the existing restoration and conservation portfolio (e.g. under environmental policies, including LIFE marine projects), identify and test new, locally adapted solutions addressing threats to biodiversity; transfer innovations and support cooperation with local research institutions; boost the understanding of the interrelation between different species, impacts of human activities on seabed integrity and its threshold values and impact of aquatic activities in the protected areas to design more effective responses; map marine biodiversity including its DNA sequencing, mapping of marine microbiomes, and improve understanding of ecological processes, historical trajectories of change and restoration possibilities; monitor and forecast biodiversity changes due to climate change or anthropogenic pressures. **New technologies:** nature-based solutions for ecosystem restoration, solutions for restoration of river flows and for coastal resilience to sea level rise; solutions for climate change mitigation for sequestration of “blue carbon”, blue reforestation, and for reducing pressures from tourism, seabed disrupting activities, destructive fishing practices like bottom trawling and other activities causing seabed habitat loss or degradation; preventing the bycatch of protected species and at the same time ensuring viable fisheries, innovative, affordable and scalable technologies to allow remote and accurate monitoring of fishing activities and operations and to ensure full traceability of fishery and aquaculture products from net to fork; develop and deploy solutions for sustainable management of sediments in river-sea systems; blue biotechnology innovation to restore marine ecosystems. **Business innovation:** know-how and new business models for generating revenue from restored ecosystems and from blue carbon sequestration, including blue biotechnologies, new carbon farming’ business models of aquaculture, near-shore restoration actions, tidal area management, and inland waters. **Social innovation, transition and governance:** Horizon Europe innovation actions for social and economic transitions towards holistic, systemic, sustainable, inclusive and long-term management of restored and protected ecosystems, including their natural as well as human, social, societal, economic and cultural elements (‘socio-ecological management’ of ecosystems), know-how and social innovations for involving local actors in active and passive ecosystem restoration and in the protection and management of valuable ecosystems.

⁸⁵ In her 2020 State of the Union Address, President von der Leyen announced that “we will use our diplomatic strength and economic clout to broker agreements that make a difference – such as designating maritime protected areas in the Antarctica”:

https://ec.europa.eu/commission/presscorner/detail/ov/SPEECH_20_1655.

The European Parliament, in its resolution of 8 July 2021 on the establishment of Antarctic Marine Protected Areas (MPAs) and the conservation of Southern Ocean biodiversity (2021/2757(RSP), “Expresses its full support for the efforts made by the European Union and its Member States [...] to establish two new MPAs in the eastern Antarctic and the Weddell Sea in the Antarctic Ocean; calls on the Commission and Member States, in preparation for the 2021 annual CCAMLR meeting, to intensify their bilateral and multilateral efforts to secure support for the establishment of these MPAs in the forthcoming months”.

Buy-in from relevant policies: the activities will be implemented with support of the DGs DEFIS, ENV, JRC, MARE, NEAR, REGIO, RTD and will be aligned with the future EU nature restoration targets.

Investment opportunities and economic impact: The Mission will develop a pipeline of conservation opportunities that generate revenue or that can be imposed as a requirement for granting authorisations and licenses and are suitable for impact investment (e.g. linked to eco-friendly tourism, leisure, biotechnology). It will also put in place processes to build a community of interested impact investors and philanthropic donors (for details, see section 3). It will identify and mobilise investments from socio-economic actors benefiting from ecosystem services. It will develop financial schemes that enable private investment in blue carbon sequestration (see section 3). Rules for the granting of licenses and authorisations will have to respect the principles of better regulation, to allow in particular SMEs to be a part the Mission effort.

Expected outcomes:

By 2025, the Mission will have the following outcomes:

- The lighthouse partners together with the European Commission will have **set basin-specific and measurable measures for ecosystem restoration targets for each lighthouse in an implementation charter that has been politically validated by 2022**;
- Operational **citizen assemblies** for the lighthouse areas (Danube river basin and Atlantic and Arctic Mission areas) and methods to **activate and involve local actors** in active and passive ecosystem restoration efforts and in the protection and management of valuable ecosystems; standards for citizen reporting of biodiversity elaborated with the involvement with the Ocean Observation initiative, once established and a **digital platform** to enable scaling and co-creation of Mission restoration projects among stakeholders;
- A better understanding of the impact of different activities in protected areas and know-how to **design effective protection measures** and to **use holistic socio-ecological management** of ecosystems at a large scale;
- A comprehensive set of requirements for marine ecosystems / biodiversity monitoring and forecasting, for data availability and for licensing of coastal and offshore structures through the EMODnet data ingestion system; extension of EMODnet to include changes in marine and freshwater habitats, as well as their current extent and nature;
- A precursor of a holistic environmental and marine ecosystem monitoring and forecasting infrastructure and services, including comprehensive biodiversity mapping and monitoring, covering at least the major protected and exploited species, monitoring and mapping of anthropogenic pressures, ready to operate under the Copernicus programme and applied to the pilot lighthouse areas;
- **New business models** and identification of actors for generating revenue from restored ecosystems, nutrient absorption (from algae and shellfish) and **blue carbon sequestration**, according to the carbon farming initiative announced in the Farm to Fork Strategy (planned for Q3 2021) and the **certification of carbon removal** announced in the Circular Economy Action Plan; identification of businesses, in particular local businesses, start-ups and SMEs capable of restoring and protecting ecosystems and obtaining sustainable revenue streams in connection with those ecosystems; creation of a **community of interested investors, donors and sustainable**

businesses who will support restored and protected ecosystems; scientific knowledge necessary to include **marine areas under the 2030 LULUCF reporting**⁸⁶;

- **A Blue Parks platform** as a technical assistance mechanism for local and regional initiatives for more effective and new marine protected areas.

By 2030, the Mission will have the following outcomes:

- **Mapping of marine biodiversity and its changes and habitats and integrating the data and maps thus created in EMODnet**, e.g. filling gaps in marine biodiversity mapping, DNA sequencing of marine biodiversity, understanding of ecological processes, mapping and assessment of anthropogenic pressures, historical trajectories of change and restoration possibilities, solutions to the main pressures (e.g. sequestration of “blue carbon”, blue reforestation).
- **Monitoring and prediction services for biodiversity integrated in Copernicus** connected to Mission lighthouses, regional and local services, with capacity for what-if scenarios assessments linked to climate change scenarios and restoration/exploitation strategies and decision-making about anthropogenic pressures;
- **Protection and restoration of key marine and river ecosystems and effective and cost-efficient monitoring** of MPA conservation measures; **innovative solutions** to reduce the impact of bottom trawling and of most harmful gear, prevent unwanted bycatch while ensuring viable fisheries.
- **Developed, tested and implemented at river basin and sea basin scale active, passive and nature-based solutions for marine and freshwater ecosystems restoration including in particular:** effective restoration methods, incl. active restoration of degraded habitats (such as seabeds), in particular through removal of anthropogenic pressures, nature-based solutions, blue reforestation, ecological engineering and full ecosystem-based management of local activities. Solutions for restoration of river ecological flow and for sustainable management of sediments in river-sea systems, increased public awareness about ecosystem restoration and its benefits for communities, local actors involvement in financing ecosystem restoration, reliable scientific basis for including aquaculture and marine protected areas in LULUCF reporting, knowledge for climate change mitigation actions, in particular for “blue carbon” sequestration and blue reforestation.
- Developed within the **Blue Parks** a **pipeline of conservation opportunities that generate revenue** or that can be imposed as a requirement for granting authorisations and licenses and are suitable for impact investment.
- Increased **public understanding and awareness** of the actions needed to protect and restore degraded habitats/ecosystems.
- Input and basis for further legislative, regulatory and international frameworks needed to achieve the transition towards sustainable ecosystem management and a climate-neutral economy (in particular for the upcoming EU nature restoration targets, reviews of the Marine Framework Strategy Directive, Water Framework Directive and related delegated and implementing acts).

⁸⁶ The Commission will put forward in summer 2021 a proposal to revise the Regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (LULUCF).

Expected impacts by 2030:

- **Relevant EU Biodiversity Strategy targets for 2030 (see section 1.3) have been reached, including a substantial contribution to reaching the upcoming EU nature restoration targets.**

2.2.2. Objective 2: Prevent and eliminate pollution

Outputs: To significantly reduce pollution, the Mission will launch a **lighthouse in the Mediterranean Sea** to connect and structure existing activities, disseminate and upscale solutions and mobilise relevant actors. The initial focus will be on plastic pollution, while agricultural pollution (nutrients) and urban/industrial pollution (chemicals), as well other sources of pollution such as pharmaceuticals and noise will subsequently be addressed. The lighthouse will implement a portfolio of activities, following the zero pollution hierarchy⁸⁷.

Research and innovation: The Mission will draw and boost the uptake of extensive Horizon 2020 investments⁸⁸ incl. the European Green Call, investments from Member States⁸⁹, as well as future projects funded Horizon Europe Cluster 6 to tackle plastic, chemical and nutrient pollution as well as other forms of pollution (e.g. pharmaceuticals, persistent toxic, chemicals and noise) in the water system. The Mission will fund research and innovation and transfer results by building on existing channels and platforms (e.g. SwitchMED⁹⁰, SEMED⁹¹):

1. **Prevent:** Prevent upstream and reduce the generation of pollution, e.g. (micro-)plastic waste by design, introduction of renewable, bio-based and marine bio-degradable materials and processes improving the circularity of the plastics system; substitutes for polluting substances in agricultural, industrial and domestic use, more circular product design such as fishing gear including improved reparability and durability in close cooperation with the business community in the respective industrial ecosystems.
2. **Minimise:** Minimise and subsequently eliminate (micro-)plastic waste, chemical and nutrient pollution entering into (aquatic) environments at land and at sea, through improved collection (incl. in ports and coastal areas), sorting, recycling (e.g. chemical, organic) of waste, waste water treatment and adequate port reception facilities, solutions for addressing accidental loss of containers and fishing gear.
3. **Eliminate and Remediate:** Collect and re-use waste from source to sink in an environmentally sound and economically feasible way, where litter can generate environmental or socioeconomic harm (for example river mouths, coasts, hotspots); certificates for clean-up and recollection certification, business cases for use of recycled plastic from marine litter; technical solutions for the removal of persisting toxic substances in water (PFAS, mercury, etc.); development of “greener” pharmaceuticals that degrade more readily to harmless substances in water and the environment; technological solutions to reduce anthropogenic noise.

⁸⁷ COM(2021) 400 final EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil

⁸⁸ The lighthouse can draw on the results of substantial Horizon 2020 investments, building on the marine pollution project portfolio (cf. Dimitrova et al. 2021. Report of R&I Project Cluster Analysis: Horizon 2020 Marine pollution projects portfolio analysis (forthcoming)), [Sustainable and innovative solutions to tackle the plastics crisis in our ocean and seas](#), [Sustainable Blue Economy solutions](#), [Bioplastics](#), on [Soil health including nutrient regulation and water purification](#),

⁸⁹ The lighthouse will build on Member States (co-)funded solutions to tackle pollution including the ERA-Net Cofund [AquaticPollutants](#), JPI Oceans [microplastics projects](#), the [BlueMed national hubs](#)

⁹⁰ SwitchMED - Switching to a circular economy in the Mediterranean: <https://switchmed.eu/>

⁹¹ Startup Europe Mediterranean (SEMED). <https://semed.eu/>

4. **Monitor and control:** In close coordination with existing processes, in particular under the Marine Strategy Framework Directive in the EU and through data obtained by other processes in place in the neighbouring countries, establish and maintain reliable baseline data on the stocks, flows, pathways, hotspots and time-dependent trends of different pollutants in different environmental compartments.

Buy-in from related policies and Member States: The lighthouse will be implemented with the involvement of DG AGRI, DEFIS, EAC, ENV, GROW, JRC, MARE, MOVE, NEAR, REGIO, RTD. The support of all riparian states is needed to achieve a pollution-free Mediterranean Sea basin. It will therefore work in synergy with the **EU's Neighbourhood Policy** and involve the EU's Neighbourhood partner countries in the Mediterranean. Through the structures of the Neighbourhood Policy and the Regional projects on environment, the national hubs established by the BlueMed initiative, the Union for Mediterranean working group on Environment, the European Commission will propose to continue to provide technical assistance, encourage Member States and Neighbourhood countries to exchange, disseminate and deploy innovative solutions and develop regulatory responses to tackle plastic pollution. The lighthouse will build on extensive prior activities and commitments to tackle pollution in the Mediterranean Sea under the Neighbourhood Policy as well as with relevant non-EU policies, the UNEP-Mediterranean Action Plan and its Action Plan against marine litter, the Union for Mediterranean's Declaration on the Blue Economy⁹², the BlueMed Pilot for a healthy and plastic-free Mediterranean. Synergies with governance mechanisms, like the EUSAIR macroregional strategy and the WestMED initiative will be developed through this cooperation.

Investment opportunities and economic impact: The lighthouse will upscale, build and fund a pipeline of projects from research to demonstration of solutions to their market roll-out. It will seek to align, as appropriate, with relevant EU programmes and Member States investment (see section 3.1) and develop investable and bankable ventures that prevent, minimise, eliminate and monitor pollution from source to sea (see section 3.2).

Expected outcomes:

By 2025, the Mission will have delivered the following outcomes:

- The lighthouse partners (Member States, macroregions, regions, international partners, other stakeholders) will have **defined, based on existing agreements, concrete measures for the basin for pollution reduction in an implementation charter that has been politically validated** by 2022.
- Developed and disseminated **scalable breakthrough innovations** (technological, business, social and governance) to prevent, minimise, remediate and monitor pollution.
- A transparent and collective **monitoring system** (based on national and regionally agreed mechanisms and existing structures such as the 2030GreenerMedInitiative⁹³ and taking into account citizen science) of the major sources, pathways, hotspots and impacts of pollution in the Mediterranean Sea, meeting assessment needs of the Marine Strategy Framework Directive.

⁹² Union for the Mediterranean (UfM) Ministerial declaration on Sustainable Blue Economy- 2 February 2021: <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

⁹³ <https://ufmsecretariat.org/wp-content/uploads/2021/05/UFM-2030GreenerMed-Agenda-and-Annex-1-Update-May-2021.pdf>

- A **digital platform** to enable scaling and co-creation among stakeholders to share zero pollution best practices and monitoring information so that it can be fostered in the Digital Twin Ocean, starting with facilities available in the Copernicus Mediterranean Sea and Black Sea monitoring and forecasting centres and EMODNet.

By 2030, the Mission will have delivered the following outcomes:

- Deployment of solutions to **prevent, minimise, remediate and monitor pollution across the Mediterranean Sea basin.**
- 50% increase in EU production and deployment of low-cost, low environmental impact platforms and sensors for ocean observation.
- Access for all Member States, regions and stakeholders across the Mediterranean and the whole of Europe to replicable breakthrough **innovations to prevent, minimise, remediate and monitor pollution** in the ocean and waters.

Expected impacts:

- **Relevant Zero Pollution targets for 2030 (see section 1.3) have been reached.**

2.2.3. Objective 3: Make the sustainable blue economy carbon-neutral and circular

Outputs: To **efficiently use marine and coastal resources to reduce net greenhouse gas and other emissions**, the Mission will launch an **emission reduction lighthouse in the Baltic and North Sea** to pave the way towards a productive, yet sustainable use of water space. The lighthouse partners will apply emission-free measures to the main maritime economic sectors at sea basin-scale, complementing the measures taken by other ongoing EU initiatives. The lighthouse will develop, assess and de-risk technological solutions for clean ocean and wind energy, among others, and their connection to infrastructure. Other emerging sectors, such as zero emission waterborne transport incl. wind propulsion ships (container ships, cruise ships, cargo vessels, etc.) can also contribute to reducing emissions at sea. The coexistence and synergies of economic activities in the maritime space, for instance through multipurpose off-shore platforms will be equally important. Circular and zero-carbon aquaculture will be key and new sources of low-impact food and feed, for instance from algae production will have a much smaller carbon footprint than land-based animal proteins. A **Blue Forum** will bring together all stakeholders with maritime interests to resolve conflicts and facilitate compatible and accepted solutions. The Mission will fund cross-border and cross-region cooperative demonstration projects.

Research and innovation: The Mission will draw on the results from the Horizon 2020 Green Deal Call topics on offshore renewable energy technologies and green ports for sustainable and smart mobility supporting transformative changes as well as the first wave of topics of Horizon Europe Cluster 5 on renewable energy and waterborne transport. Through Horizon Europe, this Mission will fund innovation actions for technical solutions for the use of renewables in coastal areas and ports as well as actions for multi-use of sea space. It will build on results of previous projects and on the Connecting Europe Facility project portfolio to identify new, locally adapted solutions to contribute to the transition towards a net zero emissions, circular economy. It will equally build on the R&I portfolios on multipurpose off-shore platforms, and on sustainable and circular aquaculture towards zero-carbon food production. The Mission will boost the understanding of the interrelation between different uses and the impacts of different

economic sectors to design adequate solutions. It will also cover climate change mitigation and develop tailored research solutions for the growing pressure from tourism.

Buy-in from related policies: The lighthouse will be implemented with **the involvement of CLIMA, CNECT, DEFIS, ENER, ENV, JRC, MARE, MOVE and RTD**. The EU Offshore Renewable Energy Strategy and the EU Sustainable and Smart Mobility Strategy, part of the European Green Deal, have set many key actions for the marine space. The Commission will develop with Member States and regions a common approach and pilot projects on maritime spatial planning at sea-basin level looking at risks at sea, the compatibility with nature protection and restoration. The lighthouse will support setting up the Clean Energy Industrial Forum on Renewables and the Blue Forum, as envisaged in the Offshore Renewable Energy and Sustainable Blue Economy strategies. Promotion of (1) low carbon fuels uptake (including development of new type of energy converters and fuel distribution infrastructure) and (2) continuous improvement of energy efficiency of waterborne transport, are instrumental for achieving the ambitious EU and International Maritime Organisation (IMO) shipping objectives. It will also contribute to the Farm to Fork Strategy, to the forthcoming EU initiative on algae⁹⁴ and to the implementation of the new Strategic guidelines for a more sustainable and competitive EU aquaculture⁹⁵, through sustainable farmed fish, algae and seafood production with a lower carbon footprint. The lighthouse will build on extensive prior activities from the Baltic Marine Environment Protection Commission (HELCOM) and the Art. 185 Joint Baltic Sea Research Programme (BONUS). It will explore solutions from relevant initiatives, such as the North Sea Energy cooperation as well as the Baltic and North Sea R&I co-ordination and support action.

Investment opportunities and economic impact: This Mission will build on research on renewables, grids and energy transition as well as waterborne transport. Projects in the pipeline for 2021 will cover testing of ocean and wind energy, grid reliability and the development of solutions for reducing the climate change impact of waterborne transport through the Horizon Europe co-programmed partnership Zero Emission Waterborne Transport (ZEWI).

Expected outcomes:

By 2025, the Mission will have delivered the following outcomes:

- The **lighthouse partners** (Member States, macroregions, regions, third countries, other stakeholders) will have set basin-scale emissions reduction targets for 2030 at least as ambitious as the targets set in the “Fit for 55” package under the European Green Deal **in an implementation charter that has been politically validated** by 2022.
- **Battery, hydrogen or ammonia-driven ferries** calling at ports of three different countries.
- A **digital platform** to enable sharing data, best practices and solutions for scaling up in the industry sector and with policymakers in the frame of a precursor of the ocean Digital knowledge system.
- A **Blue Forum for users of the sea**, as envisaged in the Sustainable Blue Economy Strategy, to coordinate a dialogue between offshore operators, stakeholders and scientists engaged in fisheries, aquaculture, shipping, tourism, renewable energy and other activities.

⁹⁴ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12780-Towards-a-strong-and-sustainable-EU-Algae-sector>.

⁹⁵ COM(2021) 236 final

- Funding of **risk insurance for pre-commercial technologies** to alleviate the investment risk in scaling up (e.g. innovative solutions to decarbonise the shipping sector).

By 2030, the Mission will have delivered the following outcomes:

- **Deployment of zero emission (i.e. zero carbon and zero pollution, noise included) marine technologies and solutions**, devising best technological and societal innovation solutions to accompany the transition until all fleets are zero-emission, making the link to setting up Emission Control Areas.
- **Battery, hydrogen or ammonia propelled ferries** calling at ports of seven different countries.
- Emission reduction technological solutions for **renewables, ports and infrastructure** (e.g. grid connections, electricity supply for ports).
- Cost-effective solutions for setting up **fully circular, zero pollution offshore clean energy facilities** as well as solutions for **zero-carbon and toxin-free aquaculture/algae production** compatible with vulnerable marine ecosystems.
- Applied solutions for **multi-use of water space** (e.g. multi-purpose platforms and management).
- A **digital platform** integrating the ocean digital knowledge system into a Digital Twin Ocean and interoperable with digital solutions from the private sector.
- Applied solutions for **marine and freshwater carbon sinks** that sequester carbon emissions, equivalent to any remaining emissions from maritime activities.

Expected Impacts:

- **Relevant European Climate Law targets for 2030 (see section 1.3) have been reached.**

2.3. Cross-cutting enablers for the Mission toolkit

In addition to the innovative solutions developed and demonstrated under the lighthouses, the Mission will launch **two cross-cutting enablers** to support all three specific objectives, by providing access to a **digital ocean and water knowledge system** as well as broad **public mobilisation and engagement** in the co-design and co-delivery of the solutions.

The Mission will thereby provide decision-makers at EU, national, regional and local level responsible for the **management of marine and freshwaters** with a **system of support facilities**. These support facilities will allow for a **more, effective and integrated governance** and a ‘whole-of-government’ approach to the hydrosphere.

2.3.1. Digital Ocean and Water Knowledge System: Fit-for-purpose knowledge, monitoring and forecasting services

The Mission will put in place a digital ocean and water knowledge system and environmental monitoring system to better monitor, forecast, value the health and manage the aquatic system as a whole. In particular, the Mission will, building on existing structures and capacities, support the development of a fit-for-purpose observation, monitoring and forecasting system (including climate predictions) that will contribute to insights needed for the implementation of the Green Deal. In addition to existing reference systems and services, this includes the required knowledge for the identification of ecosystems with

particularly high value (ecological and societal) in need of protection and restoration, for tracking the main sources and pathways of pollution, for assessing the impact of oceanic changes on coastal communities and their livelihoods and of the overall efficiency of ongoing and proposed restoration and protection measures. It will also increase **our knowledge of our ocean and water life**, including sequencing of its DNA and unravelling microbiomes of marine and coastal ecosystems. It will integrate and process existing and newly acquired ecosystem data sets (biological, genetic and molecular), with a focus on EU coastal areas, addressing the land-water interface and engaging citizens, to produce a **first pan-European census of coastal ecosystems**. This will allow to close the knowledge gaps to restore our ocean and waters.

As a first step, by 2025, the Mission will build on, integrate and increase the capacity of existing sources of knowledge such as Copernicus (CMEMS, space observation), the European Marine Observation and Data Network (EMODnet) and EC Knowledge Centres on earth observation, biodiversity and bioeconomy, to support development and demonstration within the lighthouses. It will also build on the **European Research Infrastructures Consortium**⁹⁶, particularly the European Marine Biology Resource Centre (EMBRC) and the global ocean observing infrastructure Euro-Argo. This will contribute as an ocean precursor to the Destination Earth initiative (potentially scaled up in a Digital Twin ocean initiative by 2030), to the planned ocean observation initiative as well as to international observation systems (supporting the planned revision of the International Ocean Governance agenda), thereby improving access and sharing of data, as well as the reliability and availability of advanced modelling and forecasting capacity. This will **provide the evidence base and underpin the design of systemic solutions and a more integrated governance of the water system**, bringing consistency and continuity across the lighthouses' regional dimensions.

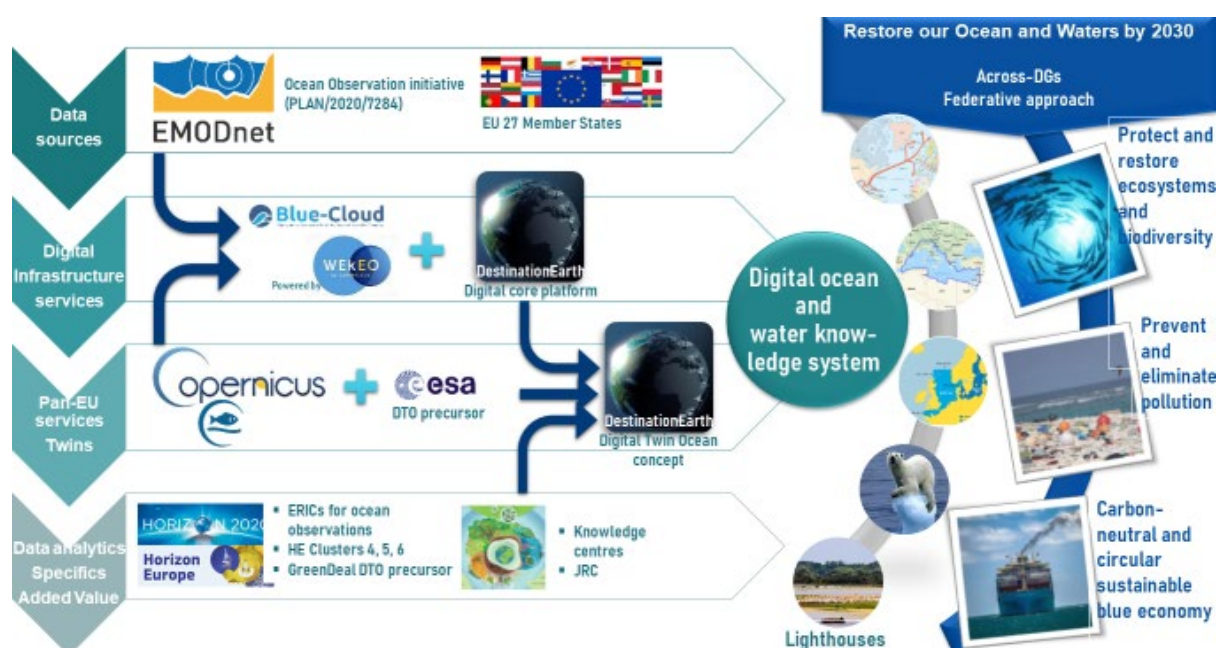


Figure 7 Building a digital ocean and water knowledge system to support the Mission

⁹⁶ [European Research Infrastructure Consortium \(ERIC\) | European Commission \(europa.eu\)](https://eur01.safelinks.europa.eu/media/press/infographic/2024/04/ERIC-infographic-2024-04-23.pdf)

Expected outcomes:

By 2025, the Mission will have delivered the following outcomes:

- **A precursor integrated digital ocean and water knowledge system from data sources to ocean modelling services based on DEFIS, MARE, CNECT, JRC, RTD capacities resulting in:**
 - **Facilitated or immediate access to increased resolution and coverage** of FAIR (findable, accessible, interoperable, reusable) data from EMODnet and Copernicus (with DEFIS, MARE);
 - **Enhanced observing and forecasting capacities** for ocean physics and biogeochemistry from relevant Copernicus services from global to coastal scale (with DEFIS);
 - **Greater flow of data from industry** facilitated by the EMODnet data ingestion service;
 - **Enhanced knowledge of marine biodiversity, microbiomes and of the DNA of aquatic life**, facilitated by the European Marine Biological Resource Centre infrastructure;
 - A digital representation, integration and processing of existing and newly acquired **coastal ecosystem data sets**, including biological and molecular data at the land-sea interface;
 - **Increased knowledge of the seabed**, e.g. contributing to a high resolution map of the North Atlantic;
 - A dynamic mapping of nature-based solutions for EU water systems;
 - A **governance** in place that allows a transparent and collective planning of ocean observation and sharing of assets;
 - Outline of an EU scale marine environmental monitoring system.

By 2030, the Mission will have delivered the following outcomes:

- **Increased knowledge, monitoring and forecasting capacity to accurately measure progress of EU policies for ocean and waters:**
 - Upgraded **Copernicus Marine Service** [with DEFIS and JRC] to improve monitoring, modelling and forecasting of the several ocean dimensions (incl. marine biology and ecosystems forecasting incl. in the coastal zone and Arctic Ocean and impacts of climate and anthropogenic stressors).
 - Developed and tested **standards, technology and protocols for monitoring and forecasting** marine species abundance, diversity and movements of aquatic life, develop dynamic marine biodiversity maps, and map and classify habitats such as wetlands, seagrass, kelp, coral, deep sea and the impact of pollution and human activities.
 - Further tested, implemented and consolidated use of **remote electronic monitoring** supported by **artificial intelligence** and **computer vision technologies** in fisheries.
 - Deployment of more **next-generation ocean observation sensors and platforms** and a greater EU share of the global market
 - An **enriched inventory of the DNA of life in our ocean and waters** (up to 50% sequenced and publicly available)
 - A **pan-European census of coastal ecosystems**, including through the use of DNA sequencing.

- A transparent and collective EU process for planning and implementing ocean observation including all communities – research, environment, fisheries, navigation etc.
- **Consolidated and integrated existing programmes into a Digital Twin Ocean for a more comprehensive and holistic forecasting and assessment of the ocean and waters**, including marine and freshwater biodiversity:
 - A **modelling and scheduling environment** for co-creation and simulation from Destination Earth (with DEFIS, MARE, CNECT, RTD, JRC) based on its core digital platform and Copernicus⁹⁷;
 - Seamless access to increased quantity and quality of data from EMODnet (including from citizen science) and Copernicus, Horizon 2020 and Horizon Europe projects (including those under the Horizon Green Deal call 2020⁹⁸), meteorology and climatology through Destination Earth;
- **Adequately valued natural capital of the water cycle and its ecosystem goods and services**:
 - Quantification of non-fed aquaculture’s role in nutrient uptake.
 - Contribution of aquaculture and protected areas for greenhouse gas emissions and carbon sequestration with a view to including coastal and inland water areas in the LULUCF scope.
 - Facilitated reporting of environmental indicators and reduced administrative burden through implementation of “*measure once, use many times*” and streamlined reporting.

2.3.2. Public mobilisation and engagement: Citizen participation, engagement, co-creation, activation, training and education

The Mission will connect Europe’s citizens and local communities with the ocean, seas and waters, facilitate broad ownership and education and co-design the transitions within the communities that will allow the European Green Deal targets to be reached.

The Mission will act as a new tool to pilot deliberative democratic decision-making that will help citizens to co-design the future of Europe, in terms of sustainable management of aquatic resources and co-implement transformative solutions supporting the restoration of EU waters such as the Mission lighthouses and scale up projects. To empower and activate citizens to take action, the Mission will promote the practice of social innovation and ocean and water citizen stewardship, where appropriate through the voluntary European Solidarity Corps. It will leverage social innovation throughout the co-design, co-development, co-implementation, and co-monitoring of solutions for sustainable use of the ocean and waters. To promote better public understanding and engagement, the Mission will support education and training activities, and launch regular citizen science campaigns together with the Member States, building on and enhancing the EU’s work to date on ocean literacy. To create stronger public connection and engagement with the ocean and waters, the Mission will draw on the power of arts, media and culture.

⁹⁷ Further funding for implementing the Digital Twin Ocean (infrastructure investment to be explored under the second DEP WP 2024); the ultimate amount will depend on the maturity of the twin as a result of the ongoing H2020 call if the Digital Twin Ocean is selected for implementation.

⁹⁸ Horizon 2020: LC-GD-9-3-2020 Transparent & Accessible Seas and Oceans: Towards a Digital Twin of the Ocean

Expected outcomes:

The Mission will by 2025 have delivered the following outcomes:

- Tried and applied **deliberative democracy mechanisms** and social innovation practices for the co-design and co-implementation of solutions for the restoration of the aquatic environment.
- Developed and piloted frameworks and processes for participatory governance and deliberative democracy, including an EU-wide **network of assemblies**⁹⁹ to enable effective citizen and stakeholder involvement in the lighthouses.
- Up-scaled the **European Research Area funded pilot citizen science campaign “Plastic Pirates – Go Europe”** together with further Member States.
- Involved the **European solidarity corps** in restoration projects.
- Promoted **apps allowing citizens to collect data and observations** and will promote (digital) data collection and participatory research involving citizens for the monitoring and restoration of ocean and waters; the collected data will be harmonised and made publicly available through the Digital Twin Ocean, EMODnet and/or the Copernicus Marine Service.
- Provided **knowledge and methodological frameworks to support the revision** of the International Ocean Governance agenda.

The Mission will by 2030 have delivered the following outcomes:

- **All European citizens have the opportunity to engage** in the preservation and restoration of oceans and waters **through participative means, volunteering and citizen science.**
- **All European citizens are empowered to be actors** in the preservation and restoration of oceans and waters through social innovation, awareness raising, education and training.
- Promoted EU-wide annual **ocean literacy campaigns**, in cooperation with the **EU4Ocean Coalition** to strengthen public awareness and overcome the emotional disconnect with the ocean and waters¹⁰⁰.
- Launched **regular citizen science campaigns** as a part of novel participatory research initiatives to increase the reach, quality and impact of scientific initiatives and boost the environmental awareness of the participants.

3. Budget and investment strategy

Delivering a **fit-for-purpose, self-sustaining, dynamic investment ecosystem** is a key need and deliverable of the Mission. The current investment landscape is characterized by high risk perceptions, a more difficult return on investment profile and consequently low investment attractiveness, resulting in significant funding gaps across the economic sectors covered by the Mission objectives.

Financing the Mission objectives will require a new level of ambition and a pathway to financial sustainability. To financially support the implementation of the Mission activities, a

⁹⁹ Horizon Europe topic HORIZON-MISS-2021-OCEAN-01

¹⁰⁰ McKinley et al. 2021. *Emotional disconnect with Europe’s aquatic environments: Report for the European Commission’s Mission board for healthy oceans, seas, coastal and inland waters*

dynamic investment ecosystem encompassing a wide array of funding sources (public, public-private, and private) and financial and non-financial instruments will be put in place at European, national, regional and local level. The mix of funding that the Mission will seek to federate under its umbrella will follow the Mission’s systemic approach and support its cross-cutting character, with innovative, fit-for-purpose financial instruments developed by the Mission.

3.1. Budget

Different funding sources will be mobilised for the different phases of the Mission. For the first phase, the research and innovation core centred on the lighthouses (see section 2.2) and enablers (see section 2.3) will be funded with seed money and in-kind contributions from Horizon Europe and other sectoral programmes (Horizon Europe¹⁰¹, LIFE¹⁰², EMFAF¹⁰³, InvestEU, Copernicus Programme without pre-empting the individual programming cycles and governance) as well with Member State funds. For the upscaling and replication in the second phase, additional national, regional and private funding will be mobilised.

Selected EU Programmes supporting the Mission	Indicative contributions
Horizon Europe 2021-2023	EUR 344.15 million ¹⁰⁴
EMFAF	EUR 217 million
InvestEU	EUR 140 million
COPERNICUS (in kind)	EUR 2430 million

Table 1 Indicative contributions of selected EU programmes to the Mission

Piloting and demonstration actions under Horizon 2020 are typically focusing on TRLs 5-7, hence a significant gap exists before the results of these demonstration actions are ready for market entry and scale up. The Mission will seek to narrow down this gap with the pathway and instruments outlined below.

3.1.1. Envisaged sources of EU public funding

The Mission will draw on a range of EU programmes and instruments to support both the developing and piloting as well as the deployment and upscaling of solutions. Mechanisms to interlink different programmes will sought, such as twinning of related project portfolios across different Programmes (e.g. Horizon Europe and LIFE) as well as “passerelle” mechanisms allowing the results of an action under one Programme to feed into actions under other Programmes.

¹⁰¹ According to Horizon Europe Annex 2 Financial programming. Please note that this is all provisional and depending on several factors: the 10% of pillar 2 is only fixed for '21-'23, for the period afterwards there will first be an interim assessment, which may change the 10% upwards or downwards; not each mission will have the exact same budget per year. This depends on the R&I needs that are defined.

¹⁰² LIFE will support the Mission but at the present time, it is difficult to ring fence budget. Also, as the bottom-up characteristic of the programme represent a difficulty in this respect, the relevant LIFE calls will be designed in cooperation with DG MARE so that projects selected can contribute to the Mission.

¹⁰³ Contribution from EMFAF will be defined at a later stage and come from the 2022-2023 Work Programme.

¹⁰⁴ Provisional and indicative Mission budget yearly breakdown: EUR 114.34m/2021, EUR 117.90m/2022, EUR 111.91m/2023.

Phase I: Development and piloting

The main sectoral programmes with committed support to the Mission are as follows:

- **Horizon Europe's** Mission budget¹⁰⁵ will cover the main R&I components for the three specific objectives and the activities under the enablers. In addition, there are several destinations across the different Horizon Europe Pillar II clusters that are relevant and can contribute to the objectives of the Mission. Indirect contributions may arise also from activities funded under Pillars I (e.g. Marie Skłodowska-Curie actions or the Research Infrastructures programme) and III (in particular through the European Innovation Council). These actions will be cross-referenced in order to provide a complete picture of their contribution and to flag additional opportunities relevant to Mission activities;
- The **Programme for the Environment and Climate Action (LIFE)**¹⁰⁶ is helping EU Member States to achieve Good Environmental Status in their marine and inland waters. Relevant future calls for the LIFE Programme will be co-designed in cooperation with DG MARE and DG ENV so that the projects selected can contribute to the Mission objectives (while respecting the overarching objectives of the programme and building on them). As an indication, previously funded LIFE projects¹⁰⁷ have contributed to biodiversity, sea floor integrity, invasive alien species, marine litter, sustainable fisheries and aquaculture, marine contamination, eutrophication, and underwater noise. The LIFE Strategic Integrated Projects¹⁰⁸ that allow statutory authorities in Member States to implement environmental and climate legislation are also a key element that could support the Mission objectives on restoration of ecosystems and biodiversity and reduction of pollution. They allow Member States to make use of other EU funding sources, including agricultural, structural, and regional and research funds, as well as national funds and private sector investment. LIFE will also support the Mission objectives via Other Actions for strategic national action plans or strategic integrated projects under the Mission lighthouses;
- The **European Maritime, Fisheries and Aquaculture Fund (EMFAF)**¹⁰⁹ under direct management will support the Mission governance, citizen engagement and mobilisation, dynamic investment ecosystem and will sustain and further develop the European Marine Observation and Data Network (EMODnet) and its integration with other existing systems and services.
- Linking with the **Digital Europe Programme on Data Spaces**, with the objective to collect large pools of data, combined with the technical tools and infrastructures necessary to use and exchange data for ensuring compliance with environmental legislation and rules related to the priority actions set in the Green Deal and to contribute to the Mission objectives. Moreover, additional specific needs on ocean and water data to be explored between CNECT, DEFIS, MARE and RTD as of 2023.
- The **Copernicus Programme** will operate and upgrade its constellation of Sentinel satellites and reinforce its marine environment and climate changes services.

¹⁰⁵ Regulation states that 'during the first three years of the programme, a maximum of 10% of the annual budget of Pillar II shall be programmed through specific calls for implementing the missions'.

¹⁰⁶ <https://www.europarl.europa.eu/legislative-train/theme-new-boost-for-jobs-growth-and-investment/file-mff-life-programme-2021-2027>

¹⁰⁷ <https://op.europa.eu/en/publication-detail/-/publication/05dc1264-88a5-11e8-ac6a-01aa75ed71a1/language-en/format-PDF/source-73443527>

¹⁰⁸ <https://ec.europa.eu/environment/archives/life/projects/ip.htm>

¹⁰⁹ <https://eufunds.ie/european-maritime-and-fisheries-fund/emfaf-2021-2027/>

Additional sectoral programmes that can support the Mission objectives are:

- **INTERREG** for coordination actions or pilots, **ERDF**, **EMFAF**, **EARDF** and **CF** for investments. Managing authorities/Monitoring Committees of INTERREG programmes will be encouraged to include specific calls for actions supporting Mission lighthouses and other actions of the piloting and development phase.
- **ERDF/ESIF** can support innovation by enhancing research and innovation capacities and the uptake of advanced technologies, reaping the benefits of digitisation for citizens, companies and governments, enhancing growth and competitiveness of SMEs and developing skills for smart specialisation, industrial transition and entrepreneurship.
- **EMFAF** under shared management places a strong emphasis on support which will contribute to the Mission objectives. This includes support for the fishing sector to switch to innovative fishing gear to reduce unwanted catch and reduce negative impacts on the seabed, support for the collection of scientific data for fish stock assessments, cessation of fishing to allow stock and biodiversity recovery, improved fisheries control and monitoring, scientific studies to support marine protected areas and Natura 2000.
- **ESF+** can provide support for skills for smart specialisation, skills for key enabling technologies, industrial transition, networking activities and partnerships between higher education institutions, vocational and educational training (VET) institutions, research and technological centres and enterprises and clusters.
- The **Just Transition Fund** aims to alleviate the social and economic costs resulting from the transition towards a climate-neutral economy, through a wide range of activities directed mainly at diversifying the economic activity and helping people adapt in a changing labour market (total envelope EUR 17.5 billion).
- The **Innovation Fund** provides support to commercial demonstration of innovative low-carbon technologies, aiming to bring to the market industrial solutions to decarbonise Europe and support its transition to climate neutrality (total envelope EUR 10 billion over 2020-2030).

Phase II: potential sources of funding for deployment and upscaling

EU programme/funding source	Objective 1	Objective 2	Objective 3
Horizon Europe	X	X	X
LIFE (in particular Strategic Integrated Projects)	X	X	
CEF			X
ESIF (ERDF, CF, EMFAF) ¹¹⁰	X	X	X
NDICI ¹¹¹		X	
RRF ¹¹²	X	X	X
INTERREG	X	X	X
Innovation Fund			X

¹¹⁰ To note that the programming for ESIF/operational plans for 2021-2027 is currently ongoing. So far, there is no concerted or coordinated action to embed actions relating to the Mission in these programmes.

¹¹¹ To note that the multiannual indicative programme for the implementation of the NDICI for 2021-2027 is being drafted, and will need to be consulted within the Commission, EEAS, and EU Member States. At this moment, no reference to financial instruments is made that would prejudice the subsequent steps in the decisions process.

¹¹²For an overview of marine and maritime-related reforms and investments included in the draft RRFs, as yet know, please see Annex 8.3.

InvestEU ¹¹³	X	X	X
BlueInvest		X	X

The Mission will seek synergies with Member States for the effective and impactful use of funding under shared management. In particular, the basin-scale lighthouses will align, explore synergies and connect with relevant projects funded under the **Recovery and Resilience Plans** and national programmes. The **Joint Programming Initiative for the Oceans (JPI Oceans)** has indicated its willingness to explore co-funding calls under this Mission with funds of its member countries.

3.2. Indicative preparatory actions (advisory and technical assistance) and further public-private and private funding

In order to support a sustainable pipeline of projects and to support companies that accelerate, incubate and solutions to the market, the Mission will actively seek to develop and reinforce financial advisory and technical assistance.

- **The EIB Innovation Finance Advisory service in support to the implementation of EU Missions in the Horizon Europe work programme (2021 – scheduled; EUR 2 million)** will deliver tailor-made advice to the Missions on how to finance the respective activities, including identification of potential financing sources, instruments and models that are most suitable for each Mission to secure their financial viability. It also includes outreach and engagement with potential investors and financial advisory services to individual (complex) flagship/demonstration/pilot projects and other funding-intensive Mission activities. The outcome of the advisory services will inform further actions. This service is time-limited (first year of the Mission only) and it will be important to secure long term advisory services via a top-up of the InvestEU Advisory Hub (see next point).
- **Mission Ocean, Seas and Waters Advisory**, will be set up as part of, for example, the InvestEU Advisory Hub. The Advisory will build on the initial Missions' EIB advisory assignment and will be dedicated exclusively and tailored to the needs of this Mission. It will increase stakeholders' capacity to develop, structure and execute investments of Mission projects, while identifying, sharing and promoting best-practices and standards. The advisory will focus on the identification and development of different funding opportunities, financial engineering advice and development of a strong pipeline of bankable/pre-bankable projects to be financed by InvestEU, other EU programmes and other public-private and private financing sources, including via blending operations.
- The **BlueInvest** platform and the **Interregional Innovation Investment instrument (I3)** provide additional technical assistance, matchmaking between companies and investors and access to finance to companies as well as interregional innovation projects.

Cooperation with the European Investment Bank Group (EIB Group)

The dialogue with the EIB Group has started. There is significant potential for closer collaboration, in particular as regards support to local/regional authorities in developing and executing investments. The EIB Group's support for the sustainable blue economy needs to be seen in the context of its climate action ambition, where in 2020 the EIB Group provided EUR 24.2 billion to fight climate change, amounting to 37% of all its financing.

¹¹³EFSD SMEW Operational Report for 2020 states that EUR 71.25 million has been invested in the Blue Economy.

Joining forces with the European Commission¹¹⁴, the European Investment Bank is financing operations aimed at reducing discharge of chemical pollutants, nutrients, plastic waste and micro-plastics to the ocean. It supports improved waste, wastewater and storm water management, providing significant expertise in project preparation, implementation and financing. **Both institutions will carry out a comprehensive market study and identify investable projects for pollution avoidance and reduction, such as, biodegradability, recycling and re-use along the entire plastic value chain.** They will offer solutions to increase access to financing, including through risk reduction facilities, provision of equity or loans, grants, all aimed at incentivizing private and public financiers to provide additional liquidity to such projects.

- i. With the **EIB Clean and Sustainable Ocean Programme**¹¹⁵, the EIB will step up its lending and advisory activities in support of the ocean:

EIB Blue Sustainable Ocean Strategy (“Blue SOS”), with a committed EUR 2.5 billion over the period 2019-2023, aims to improve the health of the ocean, build stronger coastal environments and boost blue sustainable economic activity by supporting projects in sustainable coastal development and protection, sustainable seafood production, green shipping and blue biotechnology.

➤ *LINK with Mission objectives 1 and 3*

EIB Clean Oceans Initiative (COI), with a committed EUR 2 billion over the period 2018-2023, to reduce the discharge of plastics to the ocean. Although the initiative has a global scope, in the EU, the EIB has financed for instance an improved wastewater treatment in Flanders.

➤ *LINK with Mission objective no 2*

- ii. **European Circular Bioeconomy Fund (ECBF)** (EUR 65 million EIB equity investment, backed by InnovFin) is the first equity fund exclusively dedicated to the (circular) bioeconomy providing financing to innovative growth-stage companies and projects. The blue bioeconomy and fisheries are targeted, along with packaging and nutrition.

➤ *LINK with Mission objective 3*

- iii. **Natural Capital Financing Facility (NCFF)** supports projects delivering on biodiversity and climate adaptation through tailored loans and investments, backed by an EU guarantee, with the primary aim to provide a proof of concept to demonstrate that enhancing biodiversity and ecosystem services. Targeted projects areas: blue infrastructure, payment for ecosystem services (e.g. programs to reduce water pollution), biodiversity offsets / compensation beyond legal requirements, pro-biodiversity and adaptation businesses.

➤ *LINK with Mission objectives 1 and 2*

- iv. **Developing the financial aspects of nature-based solutions**, including for resilience purposes are needed given NBS specificity as regards bankability and revenue streams, performance delay issue in natural capital space, which makes it particularly challenging for these projects to attract private finance. To this end, the Mission will build on the results

¹¹⁴ EIB Group and the European Commission join forces to protect the ocean and boost investment in the sustainable blue economy: <https://www.eib.org/en/press/all/2021-161-the-european-commission-and-european-investment-bank-group-join-forces-to-protect-the-oceans-and-boost-investment-in-the-sustainable-blue-economy>

¹¹⁵ This is the over-arching programme for the EIB’s current and future ocean-based initiatives and activities, which at present includes two main components, the Clean Oceans Initiative and the Blue Sustainable Ocean Strategy (Blue SOS), and technical assistance and advisory services to make clean and sustainable ocean projects more attractive and scalable.

of the on-going study on “*Access-to-finance conditions for innovative nature-based solutions in the EU*” implemented by the EIB InnovFin Advisory and financed from the H2020 Green Deal Call budget that will, by end of 2021, deliver recommendations.

➤ *LINK with Mission objective 1*

- v. **InvestEU Programme** where sustainable blue economy is one of the policy priorities, will be a stepping stone for the future collaboration. The **InvestEU Fund** covers the Mission objectives under a number of windows¹¹⁶. In addition, financial products are under development with EBRD and EIF.

➤ *LINK with all Mission objectives*

Throughout the lifetime of the Mission, public-private and private funding will be sought from several sources, building on ongoing discussions with private and commercial investors that have already started: **risk capital, impact investment, philanthropic funding and funding from public development banks**. In order to address the core obstacles and barriers¹¹⁷ in securing private investments, the Mission will make strategic use of the Mission’s funds to de-risk private sector participation and support an enabling environment for scaling up blue finance. The Mission will work at multiple levels to unlock private capital and to attract private investors. Activities will include: market studies; developing knowledge, data and tools for better understanding of the sector risks, and vulnerabilities, as well as opportunities for early investment; expanding the evidence base on economic case for NBS; building knowledge networks; targeted advisory services and innovative financing instruments such as blended finance and other risk reduction measures.

- For innovative businesses contributing to the Mission, **venture capital and risk capital funding** has been arranged. Early stage innovative maritime businesses (start-up or scale-up), which often builds on research grants they received from the previous research framework programmes are relevant for all three objectives under this Mission. As part of the **BlueInvest** initiative, fund managers specialising partly or wholly in the blue economy will invest in innovative start-up or scale-up innovative maritime businesses contributing to all of the three objectives. They will draw on finance of an earmarked EUR 20 million a year from EMFAF and a matching EUR 20 million from InvestEU. This will be supplemented by contributions from the European Investment Fund and external investors for a total of about EUR 140 million a year.
- The Mission will continue to approach commercial banks and investment firms involved in **impact investment** in ocean and water-related ventures. It will seek to explore the conditions under which private impact investments can be obtained. For ecosystem preservation/restoration activities, the Mission will work with investors to create investable revenue streams. For commercial activities (alternatives to polluting substances, recycling, clean ports, etc.), the Mission will co-fund supporting actions to build tailor-made investable project pipelines, involving in particular local business communities, start-ups and SMEs.
- The Mission Secretariat will seek to mobilise **philanthropic ocean funding**. A large community of donors is supporting both marine and freshwater conservation and green

¹¹⁶Such as the SIW EIB General Debt, RIDW EIB General Debt, Green Transition Investment Facility, SMEs and mid-caps, Joint equity product for the SME and RID windows - Sub-product 2 – supporting funds that invest in climate and environmental solutions

¹¹⁷ Obstacles include sustainable and investable pipeline of projects, low perceived or actual returns on investment, large upfront disbursements before reaping medium- and longer-term benefits, the public good nature of investments with no incentives for the private sector, but also lack of adequate information on risks and vulnerabilities

business investments. Selected donors will be approached to support the Mission's lighthouses.

- The Mission will reach out to the **Nordic Investment Bank** that conducts many activities in the Baltic Sea to discuss further funding opportunities.
- The Mission has established dialogue with the **European Investment Bank Group - EIB** (please see details below) **and the European Bank for Reconstruction and Development – EBRD**. Both institutions have considerable exposure to ocean-related investment. The EBRD has been funding waste and wastewater solutions¹¹⁸ and is cooperating with DG MARE on the development of an investable pipeline of projects for green shipping and ports in the Mediterranean. Both institutions fund a range of other maritime investments¹¹⁹. The Mission will seek to scale up such funding for the Mission lighthouses and subsequent scale up projects.

In view of the foregoing overview, the Mission's leverage effect, i.e. its ability to attract, leverage and mobilise further non-EU level private and public investments, is estimated to vary between 0.1 and 14, depending on the nature, maturity and riskiness of the activities at stake. The core Mission budget provided by EU Programmes (see above) will therefore be deployed as 'seed funding' aimed at catalysing and unlocking additional financing from other sources, both public and private. Overall, it is estimated that the Mission's seed funding provided by EU Programmes could mobilise additional across its objectives and enablers over the period 2021-2027, resulting in a mean investment leverage effect of 1:11¹²⁰.

4. Synergies

The Mission will act as a major structuring element to connect and align various ongoing and planned instruments and initiatives in the area of ocean and waters. While a number of instruments and initiatives already exist, they often address only parts of the water system (e.g. freshwater or marine) or only specific sectors or disciplines. The Mission will seek to build synergies by drawing on knowledge and solutions developed by other instruments, enable their transfer to other sectors and their replication across the European Union (and eventually at larger international/global scale), thereby ensuring that the ocean and waters are addressed systematically and holistically.

4.1 Synergies with other Horizon Europe Missions

All four Green Deal Missions (Restore our Ocean and Waters, Soil health, Adaptation to Climate Change, and Climate-Neutral and Smart Cities) as well as the Mission on Cancer will work together to explore synergies and share best practices on cross-cutting issues such as processes, governance structures, knowledge management, monitoring and evaluation and communication and outreach activities. The most relevant synergies between the European Green Deal Missions are outlined below.

The four Green Deal Missions will develop joint solutions through joint thematic calls, to maximise their impact across Europe. Furthermore, specific cross-Mission lighthouse will be

¹¹⁸ For instance by participating in the Northern Dimension Environmental Partnership Fund.

¹¹⁹ For instance: <https://www.eib.org/en/about/initiatives/preserving-our-oceans/index.htm>.

¹²⁰ As regards mobilisation of other resources, the expected leverage effect that will be achieved by the Mission core funding is estimated to vary between 1:0.1 (HE Impact Assessment) and 1:14 (InvestEU), depending on the nature, maturity, bankability and riskiness of the activities concerned, formulas are applied to account for these differences.

developed and projects jointly implemented by lighthouses of this Mission and demos, lighthouses and living labs of other Missions (see section 5.2, selection criteria for lighthouses). The Missions will also work together to develop a visualisation of Europe in 2050, showcasing how Europe will look like once the Missions, and Green Deal objectives have been achieved.

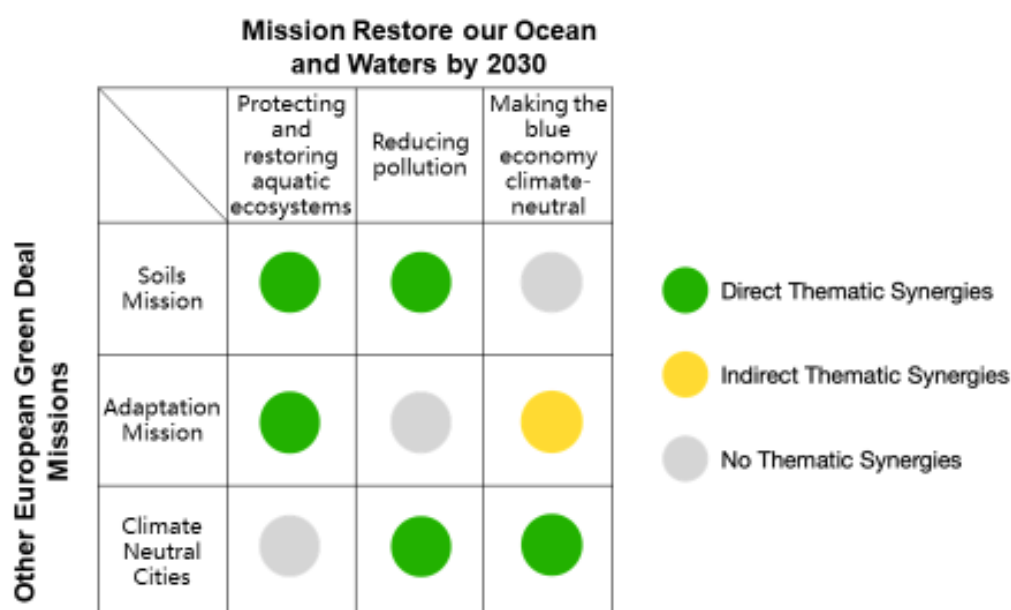


Figure 8 Synergies with other European Green Deal Missions

Cross-Mission lighthouse exploring synergies between Missions will cover the Atlantic and Arctic coastal areas and communities that will be particularly vulnerable to the risks of sea level rise and will need to adapt to ensure their population remains safe and their infrastructure is climate proof and weather resilient (see section 2.1.1. above). The **cross-cutting calls** will cover cross-Mission actions, for example river pollution and soil health, the resilience of regions affected by river flooding or carbon neutral ports in European cities. Further, **alignment between the Missions' implementing bodies** concerning knowledge management, the sharing of results, solutions and best practices, and the scaling up of the most promising innovative solutions being tested on the ground will be ensured through the Mission secretariats, national hubs and other national and regional implementation structures and through synergies with regional and macroregional Smart Specialisation Strategies and other regional strategic planning tools.

4.2 Synergies with other Horizon Europe parts and instruments

There are important synergies with a number of Horizon Europe Partnerships, incl. A climate-neutral, sustainable blue economy, Water4all, Rescuing biodiversity, Zero Emissions Waterborne Transport. A mutual input/output between relevant Partnerships and the Mission will be ensured through regular exchanges and coordination including with Member States and their national hubs and other coordination structures and partnership platforms. As the Partnership and Mission activities will run in parallel in the first Mission phase, regular workshops will be organised to ensure alignment and exchange of knowledge and information. The first workshops are foreseen in autumn 2021 for the Sustainable Blue Economy Partnership and will be replicated as of 2022 onwards for other relevant partnerships. The first lighthouse activities in the Mission will also inform Partnerships, in particular as regards the enabler activities within the Mission (ocean and water digital knowledge system, knowledge and

monitoring, citizen engagement and participatory governance frameworks and social innovation).

In addition, there are important synergies with other parts of Horizon Europe Work Programme 2021-2022, across different Clusters. Several research and innovation actions on biodiversity are included in the Horizon Europe WP 2021-2022, which will deepen the necessary knowledge base, improve or create better monitoring, assessment or policy design methodologies, as well as embark on more societal engagement for the benefit of the Mission, such as for example:

- **Ocean governance and regulation:** 2021-2022 topics will deliver by 2023 tailored scientific analyses and recommendations to the Mission (e.g. “HORIZON-CL6-2021-GOVERNANCE-01-06: Environmental and social cross-compliance of marine policies”). Also, topic “HORIZON-CL6-2022-GOVERNANCE-01-03: Multi-layer governance performance of marine policies” will provide scientific analyses and recommendations on governance to the Mission, which the Mission can take up to the lighthouses and enablers.
- **Ecosystem restoration:** in particular the demonstration project “HORIZON-CL6-2021-BIODIV-01-10: Demonstration of measures and management for coastal and marine ecosystems restoration and resilience in simplified socio-ecological systems” is expected to provide the Mission with input on large scale restoration efforts.
- **Marine pollution:** A Coordination and Support Action in the 2021 Horizon Europe Work Programme aims to improve cooperation within and across sectors, regions and countries for sharing and integration of information and development of joint measures, which can support the zero pollution objective.
- **Marine biodiversity monitoring and assessment:** the WP topics will widen the knowledge base, improve and create better monitoring, assessment or policy design methodologies and embark on societal engagement at a smaller scale. The Mission will be able to integrate this knowledge by 2025 in the digital ocean and water knowledge system and scale it up to wider areas in the second phase.

Synergies with Marie Skłodowska-Curie Actions (MSCA) will be ensured. MSCA are part of Horizon Europe Pillar I and focus on the training and mobility of excellent doctoral and postdoctoral researchers, as well as the development of doctoral programmes and collaborative research projects. The MSCA will feed the Mission with project results, data and knowledge, best practice examples as well as contribute to citizens’ engagement through its networks and Alumni Association and the annual European Researchers’ Night events.

Synergies with both the **European Research Council (ERC)** and the **European Innovation Council (EIC)**, as well as with the **JRC Work Programme** will also be addressed, by inter-linking respective projects portfolios and bridging various instruments and mechanisms (e.g. EIC pathfinders, accelerators). Finally, synergies with the **research infrastructures** will be key for achieving the Mission objectives and delivering on the knowledge, observation, monitoring and forecasting across seas, ocean and water systems.

4.3 Synergies with National and Regional Plans and Strategies

The Mission will stimulate synergies with the national, regional and macroregional Plans and Strategies by exploring existing common topics and actions. The Mission will encourage alignment of other strategies and plans at macroregional, sea basin national (Rural Development Strategies and Vision, Marine Strategies, Common Agricultural Policy plans, Marine Spatial Plans, River and Sea Basin Plans and Strategies) and local and regional level.

The Mission will carry out a pilot exploring synergies between regional or macroregional strategies with the Mission objectives, together with the JRC and other Commission services concerned.

5. Mission specific governance

5.1. Governance of the Mission

The Mission specific governance will comprise the following components:



Figure 9 Main components of the Mission specific governance

Mission governance structure under Horizon Europe legal framework and contributing EU programmes

The Commission will manage the Mission according to the Horizon Europe Regulation¹²¹. The Commission Decision on the coordinated implementation of Horizon Europe in its Articles 9-13, outlines the basic governance structure for the Mission comprising of Mission Manager, Mission Secretariat, Mission Owners Group, Steering Board and Mission Board which provides advice to the Mission. This is complemented by programming governance structures for each programme contributing to the Mission, in addition to Horizon Europe such as LIFE and EMFAF. The implementation of the Mission under the HE framework will be carried out by executive agency CINEA. The Horizon Europe Common Policy and Implementation Centre will support the overall implementation of the Mission.

A **Mission Implementation Support Platform** will be procured by the Commission for this Mission with the support of the Horizon Europe framework structures such as Common Policy and Common Support Centre and in consultation with the JRC and other Commission services and agencies. It will provide a one-stop-shop to assist with the Mission implementation, including knowledge, science to policy advice, financial advice and technical assistance, assist in capacity building, support outreach, scale up and dissemination of information, knowledge and innovations at all levels. The Implementation Support Platform will in particular provide access to knowledge to all citizens, as well as support and technical assistance to Mission Partners that implement the Mission. The Platform will be launched in 2022, together with the

¹²¹ COM(2018) 435 final

Mission lighthouses. It will integrate the Mission implementation monitoring and reporting framework.

The Mission will organise a regular **Mission Forum**, with the support of the implementation platform, to stimulate dynamic exchanges and sharing of experience, mutual learning and information and innovation dissemination throughout the EU among the Mission partners, EU institutions and citizens and stakeholders. The purpose of the Mission forum will also be to engage new partners in the Mission and its extension and scale up to new areas.

EU Institutions and bodies

Next to the European Commission, other EU Institutions such as the Council, the European Parliament and the Committee of the Regions will be regularly informed and consulted about the progress of the Mission implementation so as to enable the, to reflect results and outcomes of the Mission in policy updates and reviews. They will also be involved in providing feedback to the Mission from Member States' and citizens' perspective. The Committee of the Regions will play an important role in mobilising regions to participate in the Mission as key implementation partners. EIB and EIT will play an important role in disseminating information, coordinating and in providing input, technical expertise and contributing to Mission financial instruments.

The Mission Board has proposed a process by which “the European Institutions should adapt their own governance arrangements to ensure appropriate EU political oversight and leadership”, framed by an “Integrated Ocean and Water Plan for Europe” and periodic reporting to the European Council on the implementation of that plan.

EU networks

EU networks will play an important role in disseminating information, coordinating and in providing input, technical expertise, instruments and platforms for Mission implementation, in particular for the innovation side (e.g. EIT-KIC).

Mission partners

To achieve its objectives the Mission will seek to coordinate and cooperate with important partners, platforms and international networks active in the ocean and water sectors. The Mission will build on and expand existing platforms, such as relevant EC Knowledge Centres, Observing Systems, Communities of Practice and Advisory Services, and partners participating in the sea-basin and macro-regional strategies. Partners will play varied roles in the implementation of the Mission ranging from information dissemination and stakeholder engagement, identification of synergies and complementarities and coordination of activities with the Mission objectives, providing financial instruments, investments and financial support to Mission activities. They will also be directly involved in the Mission implementation and governance by undertaking research and innovation activities within the Mission, scaling up innovations, developing innovative products and services, new business models and many other activities needed to achieve the Mission strategic objective.

Member States and Regions will play a determinant role in the implementation, ensuring coordination at national level, for instance through dedicated national hubs, Blue Med national hubs and other national structures they have or put in place for that purpose, enabling active participation of regions, macroregions, associations of regions and communities as well as other stakeholders in the Mission. Member States and regions are expected to provide both financial and other resources for implementation at national and regional levels. Member States should also support alignment with third countries and in international fora.

Other networks and platforms will disseminate information, engage citizens (civil society organisations, NGO networks, social innovation hubs and ocean and water literacy networks) and drive the research, innovation, business and societal transformation necessary to accomplish the Mission (e.g. businesses and their networks, finance networks, philanthropy, research organisations, civil society organisations).

Stakeholder category	Examples of stakeholders	Mission Implementation	Finance & investments	Synergies/ Cooperation potential	Dissemination & engagement	International governance
Member States & regions	National level					
	Macro-regions					
	Regions & communities					
International fora	U.N. system bodies					
	River Commissions					
	Sea Basin Conventions bodies					
	Multilateral Research Alliances					
EU institutions and bodies	Committee of Regions					
	EIB					
	EIF					
EU networks	EIT-KIC					
Other networks and platforms	Networks of research performing organisations					
	ERRIN					
	NGOs /civil society					
	Literacy entities					
	Business networks					
	Finance networks					
	Philanthropy					

Figure 10 Non-exhaustive overview of the main categories of partners and stakeholders with possible roles supportive of the Mission.

Citizens and stakeholders

In line with the requirements of the HE Regulation [adoption pending] laid down in its Article 7(3), the Mission will entail broad engagement and active participation of citizens (see also section 2.4) and stakeholders, in particular through the following instruments:

- **Deliberative democracy platforms** at EU, national, regional and macroregional or sea basin level for engagement and co-creation (building on existing platforms where possible and appropriate);
- **Citizen Assemblies** established at regional, macroregional or basin level ensuring bottom up initiative and involvement in the Mission lighthouses and scale up actions.

5.2. Governance framework and guiding principles for the implementation of Mission lighthouses, Blue Parks platform and for scale up projects

The selection and implementation of the Mission lighthouses within the basins will follow the Horizon Europe principles of R&I excellence, impact-drive and competition, comprising in particular competitive calls for the selection of R&I development, testing and piloting sites and projects, open to all regions within the basin and all relevant actors throughout the EU as well as the associated countries, where relevant and as appropriate, (see section 2.1.2. Mission Lighthouses).

The Mission lighthouse governance will be implemented by Mission partners (see section 5.3 above) based on a politically validated **Implementation charter** concluded between the Member States and other actors within the lighthouse basin and the European Commission.

The main purpose of the charter is to provide political commitment to implement the Mission objectives, building on existing structures and bringing the various partners needed for the Mission implementation together. The Implementation charter will entail a baseline study that will determine the basin needs including for any further coordination and support and set out specific basin-relevant and measurable targets, including R&I targets for the lighthouse within Mission objectives. Simultaneously, synergies between the regional Smart Specialisation Strategy and other regional strategies and lighthouse objectives will be sought. The preparation of the Implementation charter will be carried out together with the existing governance and steering structures at sea basin levels, such as macroregional steering groups and committees and river and sea basin governance structures and will build on the existing sea and river basin strategies and plans.

Scale up projects will be selected and implemented following these principles:

- **Calls will be launched** as from 2025 on an annual basis to macroregions, regions and communities for expression of interest in becoming the host areas of Mission scale up projects. The call will result in preselection of regions based on criteria involving objective, scale and ambition of the project, degree of citizen and stakeholder involvement, institutional and governance readiness and financial and other resources committed to the project from different sources.
- **Agreement with scale up host region:** A baseline study will be conducted for each selected region to determine the situation and needs of the region and scale up project focus and activities. Simultaneously, synergies with regional and Smart Specialisation Strategies will be explored, with technical assistance from the JRC. Based on assessment methodologies and feasibility criteria developed as a result of¹²² initial Mission WP (2021)¹²³ implementation plan and charter with the host region will be prepared and implementation platform/consortium will be selected.
- **Implementation phase** will involve execution of the scale up project implementation plan under continuous and dynamic progress monitoring with clear milestones.

5.3. International governance

Already in 2016, the EU was the first jurisdiction in the world to develop an International Ocean Governance (IOG) Agenda. In 2020, the International Ocean Governance Forum (IOG Forum) convened by the EU, a body that assembles stakeholders in international ocean governance, published key recommendations¹²⁴ for action. These recommendations encourage the EU to continue to lead by example to champion tackling ocean degradation and lead a global ocean conservation strategy. Promoting a “whole-of-ocean-governance” approach to fight climate change is further outcome of this process. The Commission will produce an **updated IOG Agenda in 2022** in response to these IOG Forum recommendations. The updated IOG Agenda will be the cornerstone upon which the future of ocean governance will be collectively built with all international partners, taking shared responsibility for the ocean as a vital global public good, as reflected in the inclusive process of the IOG Forum.

International fora and third countries carry out many activities with important synergies with the Mission’s strategic objective. Engagement with key third countries will contribute to the success of the Mission through existing structures and initiatives such as International River

¹²³ See WP topic HORIZON-MISS-2021-OCEAN-01.

¹²⁴ <https://3rd-iog-forum.fresh-thoughts.eu/wp-content/uploads/sites/89/2021/04/IOG-recommendations-2021-WEB.pdf>

Commissions and Sea Basin Conventions, the All Atlantic Ocean Research Alliance, as well as through the UN system, which will importantly support the Mission and provide further opportunities to exchange experience and coordinate activities and synergies with partner third countries, in particular within the UN Ocean Decades for Ocean Science, for Restoration and for Water Action. Cooperation with third countries will be fostered in line with the Neighbourhood Policy frameworks and the dialogue within the Union for the Mediterranean. Synergies with the UNEP/MPA in the framework of the Barcelona convention will have to be taken into account.

In international negotiations and cooperation that can benefit the Mission, the Commission will:¹²⁵

- advocate, at the 15th Conference of the Parties to the **UN Convention on Biological Diversity**, for an ambitious post-2020 global biodiversity framework that protects and restores marine ecosystems and habitats and includes a global agreement to protect at least 30% of the world's sea area;
- support the conclusion of an ambitious, legally binding **agreement on marine biological diversity of areas beyond national jurisdiction** at the 4th Inter-Governmental Conference of the UN Convention on the Law of the Sea with the aim to promote the conservation and sustainable use of high sea resources;
- lead efforts to reach a **global agreement on plastics** and promote the uptake of the circular economy approach on plastics, which would lay the basis for a stronger and more coordinated response to plastic pollution at global level;
- continue to work towards the conclusion of the multilateral negotiations on fisheries subsidies in the World Trade Organisation - implementing Sustainable Development Goal 14.6 - to prohibit certain forms of fisheries subsidies that contribute to overcapacity and overfishing, and to eliminate subsidies that contribute to illegal, unreported and unregulated fishing;
- **support multilateral initiatives** such as the UN Decade on Ecosystem Restoration and the UN Decade of Ocean Science for Sustainable Development 2021-2030, in particular on ocean observation, ocean modelling and data sharing infrastructure;
- promote **maritime spatial planning** internationally through cooperation with the Intergovernmental Oceanographic Commission of UNESCO¹²⁶.

The Commission is committed to using all its diplomatic leverage and outreach capacities to help broker an agreement on the designation of three vast marine protected areas in the Southern Ocean (East Antarctic, Weddell Sea and Antarctic Peninsula) in the framework of the Commission for the Conservation of Antarctic Marine Living Resources.¹²⁷ Where possible, the Mission will support that effort. In particular, the Blue Parks platform, which will provide the scientific underpinning and support for the expansion of marine protected areas, will link protection efforts and protected areas in the EU with relevant international protection efforts, especially in this crucial region (see section 2.2.1).

¹²⁵ See Communication from the Commission on a new approach for a sustainable blue economy in the EU, COM/2021/240 final, section 4.5

¹²⁶ "Joint roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide", March 2017.

¹²⁷ State of the Union Address by President von der Leyen at the European Parliament Plenary, 16 September 2020: https://ec.europa.eu/commission/presscorner/detail/ov/SPEECH_20_1655

6. Monitoring and Evaluation Framework

6.1. Monitoring framework

Dynamic and real-time monitoring of the progress will be essential to keep a sense of urgency, achievement and motivation within the Mission but also to allow for informed and flexible adjustments to the Mission, when and if necessary. A comprehensive monitoring framework comprising a set of indicators, reporting and institutional framework to measure on an ongoing basis the progress of the implementation of the Mission will be developed at in the first implementation phase, also based on consultation with the JRC and other Commission services by 2022, building on Horizon Europe (Key Impact Pathways framework of Horizon Europe) and other relevant existing monitoring systems and indicators. The monitoring framework will be part of the Mission Implementation Platform under the direction of the Mission manager and Mission secretariat. It will be based on annual implementation progress reporting that will be managed by the platform.

The monitoring system could comprise the following categories of indicators (with examples of individual indicators):

- **Output indicators** will measure the progress of Mission implementation for key Mission activities.

Examples: Mission outputs (e.g. number of regions involved in a lighthouse, total area coverage of Mission lighthouses, funds invested, e.g. HE, LIFE, private investments, number of citizens involved in Mission citizen outreach and engagement activities (including citizen science actions), number of citizens volunteering for Mission projects, number of regions applying for scale up projects, number of regions implementing scale up projects.

Examples for R&I activities: number of research projects implemented within lighthouses per objective, number of social, business and financial innovation initiatives; volume of public and private funds invested in research projects, number of citizens involved in research projects, number of citizens and stakeholders involved in social innovation initiatives.

The individual indicators will be linked to each Mission specific objective to measure the outputs outlined under each specific objective in section 2.2 and under each cross-cutting enabler in section 2.3, with specific attention paid to R&I related outputs.

- **Result [Outcome] indicators** will measure the degree of achievement of the three Mission objectives (i.e., nature restoration and protection, pollution reduction, and carbon neutral and circular blue economy) throughout the EU.

Examples: volume of EU, national and private financing mobilised towards Mission objectives, number of regions applying inclusive, participatory and transformative governance frameworks and systems, number of implemented scale up projects, number of conservation projects that generated revenue, number of citizen awareness and literacy projects, number of implemented low-cost, low environmental impact platforms and sensors for ocean observation, number of ferries with hydrogen, battery and ammonia propelling systems calling at ports, number of participatory research and citizen science projects, volume of risk insurance provided to pre-commercial technologies.

Examples for R&I activities: number of innovations and technologies that have reached TRL 9, time needed to move innovation/technology through to TRL level 9; number of sustained

social innovations, number of innovations and technologies introduced to the market, number of piloted active and passive ecosystem restoration methods achieved territorial coverage of the biodiversity monitoring system, number and coverage of biodiversity and anthropogenic pressure models developed, number of species with newly sequenced DNA; number of newly identified species; number and coverage of biodiversity maps developed, number and scale of newly identified major sources, pathways and hotspots of pollution, number of piloted zero carbon sustainable aquaculture models.

The individual indicators will be linked to each Mission specific objective to measure the outcomes outlined under each specific objective in section 2.2 and under each cross-cutting enabler in section 2.3, with specific attention paid to R&I related outcomes.

- **Impact indicators** will measure the actual real-time progress of ocean and water restoration based on Green Deal, biodiversity restoration targets and on the upcoming EU Nature restoration targets.

Examples: area of protected and restored ecosystems, number of km of restored rivers, area of Blue Parks, sea area under strict protection, degree of achievement of Good Environmental Status under the MSFD, degree of achievement of the Good Ecological Status under the WFD, volume of foods from zero carbon sustainable aquaculture, number of passengers and volume of cargo transported by ferries with hydrogen, battery and ammonia propelling systems, increase in the understanding of society of ocean and waters, their restoration, and the challenges that their restoration poses.

The individual indicators will be linked to each Mission specific objective to measure the impacts of Mission activities set out in section 2.2.

6.2. Evaluation framework

Building on the evaluation framework for all Missions laid down in Article 7(3) HE Regulation, the main elements of the evaluation framework for this Mission will be as follows:

1. **Evaluation of the Mission under Article 7(3) HE Regulation**
2. **Mid-term review in 2025:** A comprehensive evaluation will be made of the progress of the implementation of the Mission (**Mid-term assessment**) including a review of the Mission objectives and targets with a view of increasing their ambition. The Mission will enter into its second implementation phase if the **mid-term assessment** will establish that key milestones were achieved. The mid-term review will also establish whether any modifications are needed to achieve the Mission objectives.
3. **Final review in 2030:** review will cover all Mission activities over its lifetime to establish whether the specific objectives were reached. The review will make recommendations as regards continuation and further scale up of the Mission activities to achieve the Green Deal objectives by 2050. It will also establish lessons learnt for the future implementation of HE Missions.

7. Communication and engagement

Building on the corporate communication around all Missions, the **main objectives of the Mission-specific communication strategy** are to communicate about the Mission and the solutions it develops, to raise awareness about the importance of a healthy ocean, seas and inland waters for life on Earth and build support for change, and to foster a shared sense of

ownership and responsibility. It will engage citizens in producing Mission-specific communication material through social innovation.

The Mission will seek to create a stronger emotional connection between society and aquatic ecosystems, which constitutes a barrier to catalysing the scale of change required **as well as welcome or elicit interest in taking action.** The Mission will seek to address the emotional connection, rather than simply attempting to ‘plug’ the knowledge gap. A focus on knowledge alone often is not sufficient for achieving communication goals. Framing messages in terms of science and evidence failed to move people to be more concerned about the health of the ocean - or towards support for pollution reduction policies. Because without care, this disconnection can be compounded by communications that fail to overcome the ‘otherness’ of our waters or that further fuel feelings of fatalism: the bleak but pervasive notion that little can be done to address the multiple crises our world faces. In addition citizens need to understand that they can “do something about it”, thereby increasing their awareness that they are agents of change.

To change hearts as well as minds on this issue, communication actions will seek to inspire awe and wonder, and connect with the things people deeply value as well as welcome or elicit interest in taking action. The Mission will support communication that uses the right metaphors to spark new associations that are relevant, engaging and down to earth. Moreover, with the Mission the EU will convey institutional leadership and change and repeat the same core idea that restoring and protecting our ocean, seas and waters is a shared responsibility.

The Mission will inspire all relevant stakeholders and empower them to develop specific solutions and take meaningful actions to restore and protect the water cycle. From 2022 onwards, Horizon Europe projects¹²⁸ will assist with providing visionary and tailor-made examples and solutions for various audiences of how to restore the ocean and waters. This includes visualising the destination of the Mission and the benefits this would bring to communities.

Strategy	• Gather insights and data to inform the strategy • Agree the overall approach and the priorities, including the priority audiences
Core Story	• Develop, consult on, test and refine by country and type of audience, and agree the core story • Produce materials and an engagement plan for sharing and spreading the core story among champions and influencers • Outline a plan for waves of communication activity (with sequence of steps, actions and milestones), focused on relevant newsworthy events and moments
Spread & Scale	• Create two exemplar campaigns that reach two distinct and different audiences (e.g. general public and children) through different channels • Map existing opportunities and connections • Identify Mission champions and influencers across countries and media outlets • Identify gaps • Define and agree targets • Define and agree measurement mechanisms

Mission champions and influencers can inspire large-scale change and impact through their own actions. The water story needs to be brought into people’s everyday lives through new channels, in public spaces and by utilising events to reach and encourage citizens to engage. The Mission will therefore engage champions and influencers (e.g. celebrities and

¹²⁸ HORIZON-MISS-2021-OCEAN-01

artists, sports personalities, broadcast personalities, scientists and conservationists, social entrepreneurs and social innovators, as well as motivated volunteers, entrepreneurs active in related industries) to share, spread and scale the right message. By collaborating with a range of champions and influencers across Europe and each of its Member States, the Mission will seek to reach citizens in a way that feels relevant to them and activates them wherever they are. Influencer partners can take a variety of forms and can allow the core story to reach a broad range of demographics.

The Mission will build on and connect the many existing projects and initiatives at EU, national and local level. With its systemic approach, the Mission will reinforce and capitalise on the resources and outputs of previously funded work. By inviting existing networks to be part of spreading the core story, the Mission will not only amplify messaging but promote change ‘on the ground’. For example, the bottom-up umbrella initiative European Ocean Coalition (EU4Ocean) connects diverse organisations, projects and people that contribute to ocean literacy and the sustainable management of the ocean. It also provides an opportunity to grow a community and to encourage those who are invested in helping our waterways to become advocates for the core story.