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Country Report — ROMANIA

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Executive summary

Romania is currently navigating a strategic transition toward a comprehensive, sustainable blue economy, moving away from isolated economic expansion toward a coordinated, sea-basin approach aligned with the Common Maritime Agenda (CMA) for the Black Sea. As of 2026, the nation's blue economy is defined by a multi-level institutional framework where responsibilities are distributed across sector-specific ministries, specialized executive agencies, and regional authorities. This governance structure aims to balance competitive maritime industries—such as offshore renewable energy, blue biotechnology, and sustainable aquaculture—with the imperative to achieve Good Environmental Status (GES) and protect vulnerable coastal ecosystems.

The national maritime sector, which generates approximately €1.5 billion in Gross Value Added and employs over 65,000 people, remains heavily anchored by industrial and primary production, including port activities and shipbuilding. Despite strong legislative progress, such as the adoption of the Romanian Maritime Spatial Plan and the Offshore Wind Energy Law, the sector faces systemic administrative challenges. Stakeholders consistently identify institutional fragmentation, complex bureaucratic permitting processes, and a lack of integrated coordination between line ministries as significant barriers that delay infrastructure modernization and hinder the agility of private-sector innovation.

Looking ahead, Romania is leveraging European funding mechanisms—including the Interreg NEXT Black Sea Basin Programme, the PNRR, and Horizon Europe—to drive a "green" and knowledge-based transition. To fully unlock its maritime potential, the report emphasizes the need for a more integrated, bottom-up governance model that moves beyond generic national policies toward actionable, localized strategies. Success will depend on simplifying bureaucratic access to funding, fostering robust industry-academia cooperation to close acute "blue skills" gaps, and establishing a unified national blue economy roadmap to harmonize sectoral efforts toward long-term economic and ecological resilience.

List of abbreviations

Abbreviation	Full Term
ABADL	Dobrogea-Litoral Water Basin Administration
ANAR	National Administration "Apele Române"
ANR	Romanian Naval Authority
AUVs	Automated underwater vehicles
BE	Blue economy
BISAC	Black Sea Advisory Council
BSC	Black Sea Commission
BSAM	Black Sea Assistance Mechanism
BSEC	Black Sea Economic Cooperation
CCINA	Chamber of Commerce, Industry, Navigation and Agriculture Constanța
CEF	Connecting Europe Facility
CFP	European Union's Common Fisheries Policy
CMA	Common Maritime Agenda
CMU	Constanța Maritime University
CN APM	National Company Maritime Ports Administration S.A. Constanța
DDBRA	Danube Delta Biosphere Reserve Authority
DOORS	Developing Optimal Black Sea Research
EC	European Commission
EU	European Union
EEZ	Exclusive Economic Zone
EMFAF	European Maritime, Fisheries and Aquaculture Fund
EMODnet	European Marine Observation and Data Network
EMSA	European Maritime Safety Agency
EDTO	European Digital Twin of the Ocean
ESD	Education for Sustainable Development
FAO	Food and Agriculture Organization
FLAGs	Fisheries Local Action Groups
GD	Government Decision
GDP	Gross Domestic Product
GeoEcoMar	National Institute of Marine Geology and Geoecology
GES	Good Environmental Status
GFCM	General Fisheries Commission for the Mediterranean
GVA	Gross Value Added
ICZM	National Strategy on Integrated Coastal Zone Management
INP	National Heritage Institute
IPPC	Integrated Pollution Prevention and Control
ITI	Integrated Territorial Investment
IUU	Illegal, Unreported, and Unregulated
MAE	Ministry of Foreign Affairs
MADR	Ministry of Agriculture and Rural Development
MApN	Ministry of National Defence
MC	Ministry of Culture

MCID	Ministry of Research, Innovation and Digitalization
MDLPA	Ministry of Development, Public Works and Administration
ME	Ministry of Energy
MEDAT	Ministry of Economy, Digitalization, Entrepreneurship and Tourism
MMAP	Ministry of Environment, Waters and Forests
MPAs	Marine Protected Areas
MSP	Maritime Spatial Planning
MTI	Ministry of Transport and Infrastructure
NAFA	National Agency for Fisheries and Aquaculture
NH	National hub
NIMRD	National Institute for Marine Research and Development “Grigore Antipa”
NGO	Non-governmental organization
PAP	Aquaculture and Fisheries Programme
PNRR	Romania's National Recovery and Resilience Plan
RAS	Recirculating aquaculture systems
RED III	Renewable Energy Directive
RIS3	Research and Innovation Strategies
PRF	Port Reception Facilities
ROVs	Remotely Operated Vehicles
SBEP	Sustainable Blue Economy Partnership
SDG	Sustainable Development Goal
SEN	National Energy System
SME	Medium-sized enterprises
SNDD 2030	National Sustainable Development Strategy 2030
SRIA	Black Sea Strategic Research and Innovation Agenda
TACs	Total Allowable Catches
TEN-T	Trans-European Transport Network
TRACECA	Transport Corridor Europe-Caucasus-Asia
TS	Territorial Sea
UDJG	Dunărea de Jos" University of Galați
UNCLOS	United Nations Convention on the Law of the Sea
UOC	Ovidius University of Constanța
VTMIS	Vessel Traffic Management and Information System
WFD	Water Framework Directive
WWF	World Wide Fund for Nature

Introduction

Objective of the report

The "Report on State of the Art: Country Report — ROMANIA" is a foundational deliverable within the BlueDial project. The overall objective of the BlueDial project is to empower a continuous public dialogue across all scales within the context of the Common Maritime Agenda (CMA). By assessing existing gaps and needs in bridging subnational and national maritime strategies with the specific priorities of the CMA, the project aims to elicit a comprehensive set of policy recommendations for achieving coordinated and coherent policy actions for each Black Sea country and the Black Sea Basin. Furthermore, the project acts as a vital mechanism to actively support and foster cooperation among regional and sub-national institutions throughout the Black Sea region.

Specifically, this report serves as a diagnostic tool to achieve these broader goals by providing a detailed mapping and analysis of the institutions, legal structures, and strategic frameworks related to the blue economy and the CMA. It aims to identify the potentials and gaps within the current strategic and institutional framework of Romania, while simultaneously evaluating how these national elements correlate with the wider Black Sea basin level. This assessment includes an investigation of funding instruments to provide a clear state-of-the-art overview of the current maritime landscape.

To ensure a comprehensive understanding, the report establishes a structured mapping of institutions and transnational direct and indirect target groups, categorized by the various sectors of the blue economy, which will be regularly updated by project partners. The methodology employed for this report combines rigorous desk research on the existing strategic and institutional frameworks with insights gathered from interviews with key Romanian stakeholders. This approach ensures the report provides detailed, accurate information on local specifics and highlights actionable areas for improvement in national blue economy policy.

Background and context

Romania is located on the western coast of the Black Sea, with the historical region of Dobrogea as its main area of contact with the sea. This region is divided into two counties: Tulcea, in the north, and Constanța, in the south. The country covers an area of approximately 238,397 km², with altitudes ranging from sea level to 2,544 m in the Carpathian Mountains.

The length of Romania's Black Sea coastline is about 255 km and is located in the counties of Constanța and Tulcea. Along the shore, there are four major port cities: Constanța, Mangalia, Midia, and Sulina. Romania shares borders with the Black Sea to the east, Ukraine to the north and northeast, the Republic of Moldova to the northeast, Serbia and Hungary to the west, and Bulgaria to the south.

Romania's landscape is diverse, including mountains, hills, plains, rivers, and coastline. The Carpathian Mountains cover nearly one-third of the country, offering spectacular scenery, vast forests, and diverse wildlife. The Transylvanian Basin and the Subcarpathian hills are areas with hilly relief and renowned vineyards, while the southern and western plains are favorable for agriculture. The Danube Delta, one of the best-preserved in Europe, hosts remarkable biodiversity. The Black Sea coast features long beaches and tourist resorts.

According to data from the National Institute of Statistics (<https://insse.ro/cms/>), as of January 2026, Romania's permanent resident population was 21.6 million, continuing to experience both

aging and decline. The urban and female populations are the majority, representing 55.2% and 51.2% of the total, respectively. In the first quarter of 2026, the overall GDP decreased by 1.2% compared to the same period of the previous year. Romania acceded to the United Nations Convention on the Law of the Sea (UNCLOS) on December 17, 1996, declaring its Exclusive Economic Zone (EEZ) of approximately 25,000 km² and its Territorial Sea (TS) of 12,400 km². Thus, the total area of the maritime space under its jurisdiction amounts to approximately 37,400 km² (<https://www.marineregions.org/eezsearch.php>). Romania's Black Sea coastline extends approximately 255 km and includes sandy beaches, cliffs, estuaries, and lagoons. The shoreline is mostly straight, except in the Danube Delta region and the Razim-Sinoe lagoon complex. Although there are no large islands or straits, temporary alluvial islands periodically form in the delta.

Overview of blue economy

Despite their widespread adoption across a diverse array of maritime stakeholders, "Blue Growth" and the "Blue Economy" remain conceptually fluid paradigms. The current discourse lacks universally standardized definitions for either term, reflecting the varied priorities and interpretations of the actors employing them (Della Libera et al., 2021; Eikeset et al., 2018).

The concept of blue economy was first introduced in 2010 by Gunter Pauli in his Blue Economy book for the Club of Rome. The book was primarily written as an answer to the financial crisis of 2007- 2008. From this perspective, Pauli claims that "the world is in need of a new economic model" (Pauli, 2011). The main objective of the book is to illustrate that a new Blue Economy model based on true economic sustainability can be shaped (Pauli, 2010).

During the Rio+20 Conference of 2012, the notion of a "Blue Economy" was raised by a group of Small Island Development States. They stressed the need to stimulate "Blue Growth," particularly for island nations and developing countries with significant coastlines and/or maritime areas (Eikeset et al., 2018; World Bank, 2020). In the same year, the concept was mentioned in the Changwon Declaration. Between 2012 and 2019 many other international organizations introduced their vision on the concept, starting with the Food and Agricultural Organization of the United Nations and followed by others, including the World Bank, the Organization for Economic Co-operation and Development, the United Nations, and others. The European Commission introduced its interpretation of blue growth and blue economy also in 2012. In its Blue Growth Strategy, the Commission defined the concept in the following way:

Definition of Blue Growth

The Commission's initiative to harness the untapped potential of Europe's oceans, seas, and coasts for jobs and growth (European Commission, 2012).

Within this framework, the Commission identified five strategic pillars for emerging blue growth: blue energy, marine biotechnology, coastal and maritime tourism, aquaculture, and the extraction of marine mineral resources. Accordingly, the strategy provides the following definition of the blue economy:

Definition of blue economy

All economic activities that depend on the sea. The individual sectors of the blue economy are interdependent. They rely on common skills and shared infrastructure such as ports and electricity distribution networks. They depend on others using the sea sustainably (European Commission, 2012).

By 2022, the distinction between "blue growth" and the "blue economy" largely dissolved, with the latter emerging as the preeminent paradigm. Today, the global discourse encompasses approximately 40 distinct definitions (Della Libera et al. 2021). While Pauli's foundational vision was inherently holistic, the institutional frameworks adopted around 2012 were disproportionately focused on economic output, driven by the urgent need for recovery following the global financial crisis. However, the blue economy has since matured into a comprehensive, multifaceted framework that places equal emphasis on economic prosperity, environmental sustainability, social equity, and robust governance. The European Commission explicitly positions a sustainable blue economy as a fundamental pillar of the European Green Deal - the overarching blueprint for transitioning the EU into a modern, competitive, and resource-efficient economy. The Green Deal functions not merely as a climate mitigation strategy, but also as the primary vehicle for a resilient and inclusive post-COVID-19 recovery (European Commission, 2021 a). This dual mandate was operationalized on May 17, 2021, with the adoption of the Communication, "A Green Recovery for the Blue Economy – Transforming the European Union's Blue Economy for a Sustainable Future." (https://oceans-and-fisheries.ec.europa.eu/blue-economy/sustainable-blue-economy_en). This landmark strategy marks a definitive paradigm shift, moving the sector away from the unchecked expansion of "blue growth" and toward a fully sustainable blue economy anchored by clean, climate-proof activities that actively drive the broader green transition. According to the European Commission: "All blue economy sectors, including fisheries, aquaculture, coastal tourism, maritime transport, port activities and shipbuilding will have to reduce their environmental and climate impact. Tackling the climate and biodiversity crises requires healthy seas and a sustainable use of their resources to create alternatives to fossil fuels and traditional food production. Transitioning to a sustainable blue economy requires investing in innovative technologies. Wave and tidal energy, algae production, development of innovative fishing gear or restoration of marine ecosystems will create new green jobs and businesses in the blue economy". (https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2341)

To operationalize this transition, the European Commission outlines six strategic pillars for the blue economy:

- **Achieving climate neutrality and zero pollution:** Scaling up offshore renewable energy (including floating wind, wave, and tidal power) with the goal of generating 25% of the EU's electricity by 2050. This is coupled with decarbonizing maritime transport and transforming commercial ports into green energy hubs.
- **Transitioning to a circular economy:** Systematically reducing marine pollution - particularly plastics and microplastics, by implementing renewed standards for fishing gear design, sustainable ship recycling, and the ecological decommissioning of offshore platforms.
- **Preserving marine biodiversity:** Designating 30% of EU waters as protected areas to reverse biodiversity loss, replenish fish stocks, and build climate resilience, while simultaneously minimizing the ecological footprint of commercial fishing.
- **Enhancing coastal resilience:** Investing in climate adaptation activities, such as green infrastructure, to protect coastlines from erosion and flooding. These measures safeguard vulnerable landscapes while sustaining the coastal tourism economy.
- **Securing sustainable food production:** Modernizing marine food systems through the promotion of sustainable aquaculture, algae and seagrass utilization, and research into cell-based seafood. This includes adopting new marketing standards and enforcing stricter fisheries control.
- **Optimizing Maritime Spatial Planning:** Fostering cross-sectoral coordination through the "Blue Forum," a platform uniting stakeholder from energy, shipping, fisheries, and

tourism. This collaborative approach ensures the sustainable management of marine spaces in alignment with the EU Directive on Maritime Spatial Planning.

The European Union defines the blue economy broadly, encompassing all ocean-, sea-, and coast-related industries. This includes activities operating directly within the marine environment (e.g., shipping, offshore energy, and seafood production) as well as supportive land-based operations (e.g., ports, shipyards, and coastal infrastructure). The economic footprint of these established sectors is substantial; the 2021 EU Blue Economy Report estimates they support 4.5 million direct jobs and generate over €650 billion in turnover (European Commission, 2021b).

Yet, the blue economy also includes marine education and research, as well those segments of the public sector directly tied to coastal and ocean stewardship – such as national defense, the coast guard, marine environmental protection.

A challenge in estimating the scope and size of the blue economy is the limited availability of data for certain maritime sectors. This lack of data, together with the lack of standardization in data collection among Member States hinders the comparability and consistency of data across sectors and Member States.

Current state of the blue economy in the Black Sea

The current status of blue growth in the Black Sea region is defined by a strategic transition toward a comprehensive, sustainable blue economy. Governed primarily by the Common Maritime Agenda (CMA), regional development has shifted away from isolated economic expansion toward a coordinated, sea-basin approach. As of 2026, the region's blue economy is characterized by an active effort to balance competitive, innovative maritime industries—such as blue biotechnology, offshore renewable energy, and sustainable aquaculture—with the urgent need to protect vulnerable marine and coastal ecosystems.

Through mechanisms like the Black Sea Strategic Research and Innovation Agenda (SRIA) and current cross-border initiatives (highlighted by scientific forums like the 2026 MARBLUE International Conference hosted in Constanța, Romania), the region is actively working to unlock sustainable blue finance and build environmental resilience across all participating nations.

The institutional framework for a sustainable blue economy in the region is anchored by the CMA for the Black Sea, adopted by the seven participating states on May 21, 2019. Building upon the commitments of the 2018 Burgas Ministerial Declaration, the CMA prioritizes ecological integrity through its primary objective: achieving healthy marine and coastal ecosystems.

The Agenda acknowledges the basin's acute vulnerability to compounding pressures. These include climate-driven stressors—such as sea-level rise, coastal erosion, ocean acidification, and thermal elevation—coupled with severe anthropogenic impacts from unsustainable maritime and terrestrial practices, notably marine litter and untreated wastewater runoff. Consequently, the core challenge for the Black Sea's blue economy is decoupling the exploitation of marine resources from environmental degradation. This delicate balance requires robust, voluntary regional cooperation to safeguard the basin's shared natural heritage—a cooperative momentum currently incentivized by regional funding frameworks like the 2026 Black Sea Project Awards, which target scalable solutions in both marine protection and competitive blue investments.

To operationalize this transition, the CMA outlines five strategic priorities designed to harmonize economic development with environmental stewardship (CMA, 2017):

- **Ensure the protection and sustainability of the marine ecosystem:** Ecosystem resilience relies on achieving a Good Environmental Status (GES) for both the sea and its tributary rivers. By taking joint protection measures under the Bucharest Convention (Convention on the Protection of the Black Sea Against Pollution), contracting parties aim to reduce anthropogenic pressures on biological resources. This ecosystem-level

approach ensures that fish stocks are restored to sustainable levels, securing income and healthy living conditions for coastal communities while meeting international environmental commitments.

- **Address marine pollution and plastic litter:** Aligned with the Bucharest Convention, this priority focuses on shifting the behavioral paradigms of Black Sea citizens and maritime operators to drastically reduce marine litter and pollution. The strategic added value stems from capacity building and the regional integration of circular economy principles, ensuring waste is minimized at the source before it reaches the marine environment.
- **Promote sustainable fisheries and aquaculture:** Governed by the 2016 Bucharest Declaration and the 2018 Sofia Ministerial Declaration under the umbrella of the General Fisheries Commission for the Mediterranean (GFCM-FAO), the region is establishing a new dynamic for living marine resources. Enhanced multilateral cooperation promotes the rational exploitation of fisheries and the sustainable expansion of aquaculture, maximizing economic benefits for coastal communities without compromising ecological thresholds.
- **Support innovative marine research infrastructures:** The fragility of the Black Sea requires continuous observation and robust, standardized data collection. Because state-of-the-art research facilities are highly capital-intensive, no single nation can support a comprehensive infrastructure independently. The CMA emphasizes the coordination, sharing, and optimization of existing hubs. By fostering open, integrated research facilities and leveraging multilateral frameworks—such as the Organization of the Black Sea Economic Cooperation (BSEC)—the region can pool resources for high-impact scientific observation.
- **Encourage the production, management, and sharing of environmental knowledge:** Effective environmental monitoring requires high-quality, accessible data to assess both human impacts and the sustainability of coastal economic activities. A major focus is understanding the complex river-delta-sea connections (most notably the Danube-Black Sea macro-region, which serves as the cornerstone of Romania's blue economy strategy). Monitoring water quality and biodiversity across these transitional waters is essential for formulating evidence-based maritime and environmental policies.

Institutional mapping by sector

National and Regional Authorities

Romania's blue economy governance operates through a multi-level institutional framework. Responsibilities are distributed across sector-specific national ministries, specialized executive agencies, and dedicated regional management authorities. This governance structure ensures alignment between national strategic interests, economic exploitation of marine resources, and strict adherence to European Union environmental directives

The institutional architecture is highly decentralized across specialized domains, requiring active inter-agency coordination to implement basin-wide initiatives like the Common Maritime Agenda (CMA).

Ministry of Environment, Waters and Forests (MMAF)

The central authority responsible for national environmental policies, climate change adaptation, and the implementation of the Bucharest Convention protocols. It ensures that blue economy

activities (from tourism to aquaculture) comply with Good Environmental Status (GES) targets and ecological preservation mandates.

Its primary mandate is to ensure that the economic exploitation of the Black Sea—spanning offshore energy, maritime transport, coastal tourism, and aquaculture—does not exceed ecological thresholds. MMAP operationalizes this mandate by translating the EU's Marine Strategy Framework Directive (MSFD) into national policy and enforcing the protocols of the Bucharest Convention to achieve Good Environmental Status (GES) across Romania's marine waters.

MMAP's influence over the blue economy operates through several distinct strategic pillars:

- **Maritime Spatial Planning (MSP) and coastal management**

MMAP played a critical role in the environmental assessment and approval of Romania's first comprehensive Maritime Spatial Plan, officially adopted via Government Ordinance No. 97/2023. By mapping out specific zones for different maritime activities, the MSP mitigates spatial conflicts between conservation efforts and economic sectors like offshore wind and marine aquaculture. Furthermore, MMAP oversees the National Strategy on Integrated Coastal Zone Management (ICZM), which was officially approved in August 2025. This strategy provides the legal and operational framework for combating climate-driven coastal erosion, regulating tourism footprint, and managing the delicate land-sea interface along the Dobrogea coastline.

- **Biodiversity and strict marine protection targets**

A major regulatory constraint that blue economy operators must navigate is MMAP's biodiversity mandate, driven by the EU Biodiversity Strategy for 2030 and funded through Romania's National Recovery and Resilience Plan (PNRR). As of the 2025 milestone, MMAP has spearheaded the identification and designation of strict non-intervention protection zones covering 10% of Romania's marine area. Within these demarcated zones, high-impact blue economy activities are strictly prohibited. This includes a ban on industrial fishing utilizing bottom-contact gear (such as bottom trawls and beam trawls) and restrictive zoning against intensive aquaculture facilities, ensuring critical benthic habitats and nursery grounds remain undisturbed.

- **Combating marine pollution and eutrophication**

The health of the Black Sea's blue economy is heavily dependent on the water quality of the Danube River. MMAP leads the Integrated Nutrient Pollution Control Project (supported by the World Bank), which targets a massive reduction in nitrogen and phosphorus discharges from agricultural and municipal sources into the Danube basin. By mitigating agricultural runoff before it reaches the sea, MMAP directly combats marine eutrophication—a chronic issue that threatens both sustainable fisheries and the coastal tourism sector.

- **Regional leadership and diplomacy**

MMAP also acts as Romania's primary representative in transboundary environmental governance. Notably, Romania is part of the Black Sea Commission (the executive body of the Bucharest Convention). Through this leadership role, MMAP is involved in basin-wide monitoring protocols and disaster response frameworks with neighboring coastal states, ensuring that Romania's domestic blue economy standards align with broader geopolitical and environmental stabilization efforts in the Black Sea region.

Ministry of Foreign Affairs (MAE)

The Ministry of Foreign Affairs (MAE) acts as the geopolitical and diplomatic architect of Romania's blue economy. Because the Black Sea is a semi-enclosed basin shared by six coastal states with complex and often competing geopolitical interests, domestic maritime policies cannot be successfully implemented in isolation. The MAE ensures that Romania's national blue economy objectives are synchronized with regional frameworks, international law, and European Union external action policies.

The MAE's influence over the blue economy is channeled through several strategic avenues:

- **Driving the Common Maritime Agenda (CMA)**

The MAE is the primary institutional anchor for Romania's commitments under the EU-backed **Common Maritime Agenda** for the Black Sea. It oversees the National Hub, which serves as the central networking mechanism bringing together Romanian academia, private sector investors, and public authorities. By facilitating this domestic dialogue, the MAE ensures Romanian stakeholders can effectively tap into cross-border funding and collaborative partnerships. A prime example of this diplomatic facilitation was Romania's hosting of the CMA's Annual Stakeholder Conference and the Black Sea Project Awards in Constanța in late 2025—a momentum the MAE continues to leverage to position Romanian innovators competitively in the 2026 sea-basin funding cycles.

- **Maritime security and offshore energy diplomacy**

In the current geopolitical climate up to 2026, the blue economy is intrinsically linked to maritime security. The MAE leads diplomatic efforts to secure the Black Sea's critical maritime infrastructure. This involves multilateral negotiations to ensure the unhindered safety of commercial shipping lanes—which are vital for global food security and regional trade—and the legal protection of newly tendered offshore energy perimeters (both natural gas and emerging offshore wind) within Romania's Exclusive Economic Zone (EEZ). Through active engagement in platforms like the Black Sea and Balkans Security Forum, the MAE strategically aligns defense dialogues with blue economy expansion, signaling to international investors that Romania's maritime domain is legally secure and stable.

Ministry of Agriculture and Rural Development (MADR)

The Ministry of Agriculture and Rural Development (MADR) dictates the strategic direction for Romania's fisheries and aquaculture sectors, acting as the primary conduit for integrating the European Union's Common Fisheries Policy (CFP) into national legislation. Central to this mission is the management of the Aquaculture and Fisheries Programme (PAP) 2021–2027, financed through the European Maritime, Fisheries and Aquaculture Fund (EMFAF). With a robust financial allocation exceeding €232 million, MADR leverages these funds to address vital vulnerabilities in national food security by modernizing fleet infrastructure, encouraging energy-efficient maritime operations, and subsidizing the advanced processing and marketing of aquatic products. By aligning its national objectives with both the EU Biodiversity Strategy for 2030 and the GFCM targets, the Ministry ensures that the commercial exploitation of Black Sea living resources remains economically viable without compromising the long-term biological sustainability of fragile fish stocks.

To operationalize these strategic policies on the water, MADR works through its specialized executive body, the National Agency for Fisheries and Aquaculture (NAFA). This agency

regulates commercial fishing quotas, actively combats Illegal, Unreported, and Unregulated (IUU) fishing, and spearheads the critical transition toward modernized aquaculture. While Romania has a long history of traditional freshwater farming, MADR's current focus actively incentivizes the development of sustainable marine aquaculture on the Black Sea coast and the adoption of high-tech, closed recirculating aquaculture systems. Furthermore, the Ministry places a heavy emphasis on the socio-economic dimension of the blue economy to drive rural development. By funding local action groups in coastal and Danube Delta regions, MADR empowers traditional fishing communities to diversify their income streams into blue tourism, establish direct-to-consumer short supply chains, and adopt circular economy practices—ultimately building local resilience against climate impacts and volatile market dynamics.

Ministry of Transport and Infrastructure

The Ministry of Transport and Infrastructure serves as the strategic architect for Romania's maritime and inland waterway connectivity, anchoring the physical logistics of the blue economy. It formulates overarching policies that integrate Romania's coastal assets into the broader European transport network, specifically the Trans-European Transport Network (TEN-T) Rhine-Danube corridor. Driven by substantial capital injections from the National Recovery and Resilience Plan (PNRR) and the Connecting Europe Facility (CEF), MTI prioritizes the modernization of waterborne infrastructure to ensure it can accommodate projected growth in global freight. A critical priority for the Ministry through 2026 is positioning Romania as a primary European gateway for the rapidly expanding "Middle Corridor"—a trans-Caspian trade route linking Asia to Europe—by aligning national transport regulations with international intermodal logistics standards.

Beyond physical infrastructure, MTI is heavily focused on the systemic decarbonization of the maritime sector. The Ministry mandates the strategic transition toward zero-emission transport logistics, incentivizing a modal shift of heavy cargo from road networks to inland waterways and coastal shipping. By coordinating national strategies for alternative marine fuels (such as LNG, methanol, and green hydrogen) and upgrading dredging policies to maintain navigable depths during climate-driven low-water periods, MTI ensures that the economic arteries of the blue economy remain resilient, efficient, and aligned with the European Green Deal.

The Romanian Naval Authority (ANR) functions as the specialized regulatory and enforcement body ensuring that the rapid expansion of the blue economy does not compromise maritime safety, security, or environmental integrity. Operating under the auspices of the MTI, the ANR exercises both Flag State and Port State Control, inspecting domestic and foreign vessels calling at Romanian ports to ensure strict compliance with International Maritime Organization (IMO) conventions and European Maritime Safety Agency (EMSA) standards. The Authority manages the critical Vessel Traffic Management and Information System (VTMIS), which digitally orchestrates the safe movement of all commercial traffic within Romania's territorial sea, preventing collisions and spatial conflicts with offshore energy installations and marine protected areas.

Equally critical is the ANR's mandate regarding environmental protection and emergency response. As the blue economy scales, the risk of maritime accidents and ship-source pollution naturally increases. The ANR is the frontline authority for enforcing regulations concerning ballast water management (crucial for preventing the introduction of invasive species into the Black Sea) and sulfur emission caps. Furthermore, the Authority leads Romania's national contingency planning for marine pollution, coordinating rapid-response interventions for oil spills or hazardous chemical discharges, thereby acting as the definitive safeguard for the marine ecosystems that underpin coastal tourism and aquaculture.

The National Company Maritime Ports Administration S.A. Constanța (CN APM) acts as the landlord port authority and commercial heartbeat of Romania's maritime blue economy. Managing the Port of Constanța—the largest and most strategically significant deep-water port on the Black Sea—CN APM is responsible for the systemic expansion and modernization of port infrastructure. By 2026, the administration has actively leveraged strategic international partnerships (such as high-profile framework agreements with global logistics operators like AD Ports Group) to attract large-scale foreign direct investment. These investments are specifically targeted at developing new greenfield terminals, expanding grain and liquid bulk handling capacities, and cementing Constanța's role as the indispensable European multimodal hub for Middle Corridor trade flows. Simultaneously, CN APM is the primary driver of the "Green Port" transition in the region. The administration is heavily investing in the digitalization of port logistics—implementing advanced Port Community Systems to minimize cargo dwell times and reduce the idling emissions of vessels and trucks. Furthermore, CN APM is aggressively pursuing sustainability-driven initiatives, including the deployment of shore-side electricity (cold ironing) to allow berthed ships to plug into the national grid rather than burning bunker fuel, the adoption of renewable energy for port operations, and the implementation of circular waste management protocols. This ensures Constanța remains commercially competitive while drastically reducing its environmental footprint.

The Administration of the Navigable Canals manages the critical artificial arteries that seamlessly link the maritime blue economy with the inland riverine economy: the Danube-Black Sea Canal and the Poarta Albă-Midia Năvodari Canal. These canals represent a strategic shortcut that bypasses the treacherous Danube Delta, cutting the navigation distance to the Black Sea by approximately 400 kilometers. ACN's primary role is to maintain, modernize, and safely operate this vital inland waterway infrastructure, ensuring uninterrupted, year-round navigability for commercial barge convoys transporting agricultural commodities, construction materials, and intermodal containers between Central Europe and the Port of Constanța.

In the context of the 2026 sustainable blue economy, ACN's operations are pivotal for facilitating eco-friendly freight transport. Because inland waterway transport generates a fraction of the greenhouse gas emissions compared to road haulage, ACN actively supports the EU's modal shift objectives. To optimize this, the administration is heavily focused on digitalization and climate resilience. This includes the deployment of advanced River Information Services (RIS) to optimize traffic flow and lock operations, as well as executing major infrastructural upgrades to the canal banks and lock mechanisms to ensure operational stability despite the increasing frequency of extreme weather events and fluctuating water levels driven by climate change.

National Administration "Apele Române"

The National Administration "Apele Române" (ANAR) functions as the primary executive agency responsible for the unified and sustainable management of Romania's water resources. Operating under the coordination of the Ministry of Environment, Waters and Forests (MMAF), ANAR ensures that the extensive network of national rivers, lakes, and transitional waters is managed according to the principles of the EU Water Framework Directive. Within the context of the blue economy, ANAR's mandate is critical for maintaining the ecological balance required for both freshwater aquaculture and the broader river-delta-sea continuum. The administration oversees large-scale hydrological infrastructure, enforces water quality standards through rigorous monitoring networks, and implements the "polluter pays" mechanism. By managing flood risks, mitigating drought impacts, and controlling pollution discharges into the Danube and other key river basins, ANAR directly safeguards the downstream health of the Black Sea marine environment from land-based anthropogenic pressures.

Operating as the most strategically vital regional branch for the maritime sector, the Dobrogea-Litoral Water Basin Administration (ABADL) plays a direct, hands-on role in governing the coastal blue economy. ABADL is uniquely tasked with the administration of Romania's coastal zones, inland maritime waters, the territorial sea, and the beaches of the Black Sea. Beyond its critical function in executing complex coastal protection projects to combat severe climate-driven erosion, ABADL is the definitive authority for spatial allocation along the coastline. Crucially, it oversees the legal administration and public concession of specific maritime perimeters. This includes the heavily regulated tendering of offshore blocks—such as the recently demarcated zones between Mamaia and Constanța—which are explicitly designated to host Romania's first commercial marine aquaculture farms. By balancing strict environmental monitoring with the spatial facilitation of new blue investments, ABADL acts as the frontline gatekeeper for ensuring that marine resource exploitation aligns with sustainable coastal resilience.

Ministry of Development, Public Works and Administration (MDLPA)

The Ministry of Development, Public Works and Administration (MDLPA) serves as the central competent authority for Maritime Spatial Planning (MSP) in Romania. Crucially, MDLPA spearheaded the complex process of drafting, coordinating, and eventually adopting Romania's first comprehensive Maritime Spatial Plan, officially enacted through Government Ordinance in late 2023. By mapping out the spatial and temporal distribution of current and future maritime activities—spanning shipping lanes, fisheries, offshore energy perimeters, and marine conservation zones—the Ministry ensures that the expansion of the blue economy occurs without generating spatial conflicts or compromising the marine environment. Through its General Directorate for Regional Development and Infrastructure, MDLPA provides the legal and spatial framework that guides long-term strategic investments in the Black Sea, acting as the primary mediator between economic exploitation and integrated coastal zone management.

Beyond its regulatory and planning mandate, MDLPA acts as a vital financial catalyst for the regional blue economy by serving as the Managing Authority for the Interreg NEXT Black Sea Basin Programme 2021–2027. In this capacity, the Ministry manages and disburses significant European territorial cooperation funds aimed at boosting innovation, digitalization, and environmental resilience across participating Black Sea nations. By financing cross-border pilot projects that align directly with the Common Maritime Agenda, the EU Strategy for the Danube Region, and the European Green Deal, MDLPA actively supports the transition of coastal communities toward sustainable blue practices. This dual role—as both the spatial regulator of Romania's maritime domain and the financial engine for transnational maritime cooperation—solidifies MDLPA's position as a cornerstone of the Black Sea's sustainable economic governance.

Ministry of Economy, Digitalization, Entrepreneurship and Tourism

The Ministry of Economy, Digitalization, Entrepreneurship and Tourism (MEDAT)—operating through its General Directorate for Tourism—is the central authority responsible for harnessing the economic potential of Romania's coastal and maritime heritage. Within the blue economy framework, MEDAT's primary objective is to manage and sustainably expand the coastal tourism sector, which historically represents one of the largest economic engines of the Dobrogea region. The Ministry formulates national strategies to combat the chronic seasonality of Black Sea tourism, incentivizing the development of year-round attractions such as balneotherapy, ecotourism, and specialized nautical tourism. By integrating its sector-specific policies with the

broader CMA, MEDAT aims to shift the coastal paradigm from high-density, high-impact summer tourism toward high-value, sustainable "blue tourism."

Furthermore, MEDAT plays a critical role in the spatial and qualitative regulation of tourism infrastructure along the coast and within the fragile Danube Delta. It is responsible for classifying accommodation structures, certifying specialized eco-tourism destinations, and providing financial stimulus (such as state-aid schemes and the "Woman Entrepreneur" program) to local HoReCa businesses and coastal communities. By actively promoting the digitalization of tourism services and enforcing sustainability criteria for new coastal developments, the Ministry ensures that the economic influx generated by domestic and international visitors does not accelerate coastal erosion or exceed the carrying capacity of Romania's marine ecosystems.

Ministry of Culture

The Ministry of Culture (MC) acts as the regulatory guardian of Romania's extensive, yet highly vulnerable, underwater cultural heritage, balancing the expansion of offshore industrial development with the preservation of multi-millenary archaeological assets located on the Black Sea's continental shelf and within the Danube Delta. Under Romanian law, the entire continental shelf holds significant archaeological potential, encompassing submerged Greek, Roman, and Byzantine vestiges, alongside historical shipwrecks and prehistoric settlements like the underwater tell of Taraschina. Before any major blue economy infrastructure—such as offshore wind turbine foundations, telecommunication cables, or deep-water natural gas pipelines—can be installed, developers must obtain an archaeological discharge certificate issued via MC's specialized commissions and the National Heritage Institute (INP). Evaluating underwater diagnostic surveys allows the Ministry to either protect sites by demanding project rerouting or legally declassify them to permit economic exploitation, placing the institution at the center of complex Maritime Spatial Planning (MSP) debates, particularly highlighted by high-profile legal scrutiny surrounding large-scale offshore gas and energy extraction perimeters like the Neptun Deep project.

Beyond its restrictive regulatory functions, the Ministry of Culture serves as a key stakeholder in diversifying Romania's coastal tourism portfolio by transforming underwater archaeology from a purely academic discipline into a sustainable economic asset. By partnering with regional institutions—primarily the National History and Archaeology Museum of Constanța and supporting cross-border research initiatives like the HERAS project, which mapped submarine heritage across the Romanian-Bulgarian shelf, the MC actively promotes the concept of sustainable "blue tourism." The Ministry provides the essential legal and protective framework required to establish regulated underwater archaeological parks and specialized SCUBA-diving routes. This strategic valorization allows the local HoReCa and recreational maritime sectors to tap into high-value niche tourism markets, fostering local economic growth while strictly safeguarding the physical integrity of Romania's submerged shared cultural heritage.

Ministry of Energy

The Ministry of Energy (ME) is the primary catalyst driving the industrial and renewable transformation of Romania's maritime space, spearheading the nation's transition into a multi-regional energy hub. A cornerstone of the Ministry's current blue economy mandate is the operationalization of the historic Offshore Wind Law (Law 121/2024). Operating under the strategic framework of the World Bank's "Offshore Wind Roadmap," the ME is actively finalizing the spatial delimitation of optimal Black Sea perimeters and enacting the secondary legislation necessary to launch Romania's first competitive concession tenders. With a baseline target of

installing 3 GW of offshore wind capacity by 2035, the Ministry is not only structuring the financial and regulatory mechanisms for green energy generation but is also actively coordinating with maritime stakeholders to develop a domestic supply chain. This includes facilitating the strategic industrial upgrades required at the Port of Constanța to handle the complex logistics, storage, and assembly of deep-water wind components.

In parallel with the rapid expansion of offshore renewables, the Ministry of Energy strategically manages the transitional exploitation of the Black Sea's deep-water hydrocarbon reserves, which remain a critical pillar of both national and European energy security. The ME oversees the broader energy policy framework that enables massive infrastructure projects like "Neptun Deep"—the largest offshore natural gas venture in the Romanian Exclusive Economic Zone (EEZ), which is slated to deliver its first gas by 2027. Crucially, the Ministry's responsibility extends beyond offshore resource extraction to systemic grid integration. To accommodate the massive influx of electricity generated by future offshore wind farms, the ME is coordinating a systemic overhaul of the National Energy System (SEN). This involves directing major capital investments toward critical coastal grid reinforcements, including the deployment of High-Voltage Direct Current (HVDC) transmission lines that will seamlessly export the energy harvested from the blue economy across the broader European network.

Ministry of Research, Innovation and Digitalization (MCID)

Within the multi-level governance of the blue economy, MCID plays a critical role in bridging the gap between scientific marine observation and the digital transformation of maritime industries. While the physical regulation of the coast falls to environmental and transport authorities, MCID acts as the technological and financial engine for the region's "smart" transition. Its primary mandate is to fund and coordinate the implementation of the Black Sea Strategic Research and Innovation Agenda (SRIA). Through its national research grants and by facilitating Romanian participation in EU framework programs like Horizon Europe, MCID provides the capital required to develop advanced maritime technologies. This includes funding cutting-edge sectors such as blue biotechnology, automated underwater vehicles (AUVs) for deep-water surveying, and the integration of artificial intelligence into oceanographic data processing.

Furthermore, MCID is the governing authority overseeing Romania's premier marine science institutes, most notably the National Institute for Marine Research and Development "Grigore Antipa" (NIMRD) in Constanța. The Ministry is heavily focused on the digitalization of marine data, spearheading initiatives to develop a "Digital Twin of the Black Sea"—a highly complex, real-time virtual model of the marine environment. This digital infrastructure is essential for the blue economy, as it allows operators and regulators to accurately simulate the environmental impacts of offshore wind farms, track the dispersion of marine pollution, and monitor fish stock dynamics, ensuring that economic exploitation is backed by precise, data-driven forecasting.

The Ministry of National Defence (MApN)

MApN operates as the fundamental security guarantor for Romania's blue economy, ensuring that the commercial exploitation of the Black Sea occurs within a stable and protected maritime domain. Given the complex geopolitical volatility and the persistent threat of drifting sea mines in the region, the sustainable expansion of maritime transport, coastal tourism, and offshore energy is intrinsically dependent on the defensive umbrella provided by the Romanian Armed Forces. To safeguard critical commercial shipping lanes, MApN has taken a leading role in regional maritime security architectures. A prominent milestone is the operationalization of the Mine Countermeasures Black Sea (MCM Black Sea) Task Force, a strategic joint initiative launched alongside Turkey and Bulgaria. Through the Romanian Naval Forces, MApN actively conducts

mine-clearance operations and continuous maritime surveillance, neutralizing immediate physical threats to the civilian shipping and port operations that underpin the region's economic connectivity.

Beyond surface navigation, MAPN holds the critical mandate of defending Romania's expanding offshore industrial infrastructure, particularly within the Exclusive Economic Zone (EEZ). Because the EEZ—located up to 160 kilometers offshore—is not covered by the collective defense guarantees of NATO's Article 5, the responsibility for securing multi-billion-euro assets like the Neptun Deep natural gas platforms and future offshore wind perimeters falls squarely on national capabilities. To address this, MAPN is executing a rapid modernization program focused on advanced maritime domain awareness. By 2027, this involves the deployment of integrated sensory networks, unmanned aerial and surface vehicles, and advanced coastal radar systems financed partially through European defense initiatives. In close coordination with the Ministry of Internal Affairs and the Coast Guard, MAPN ensures the resilience of subsea telecommunication cables and energy pipelines, signaling to international investors that Romania's offshore economic frontier is rigorously protected against asymmetric threats and unauthorized interference.

Ministry of Education

The Ministry of Education (ME) forms the foundational pillar of Romania's blue economy by shaping its most critical resource: specialized human capital. While other ministries regulate physical infrastructure or allocate financial capital, the Ministry of Education ensures that the domestic workforce is equipped to meet the high-tech, complex demands of the evolving maritime industry. It regulates and accredits specialized higher education programs across Romania's premier coastal institutions—most notably the Constanța Maritime University, the "Mircea cel Bătrân" Naval Academy, and Ovidius University of Constanța. By authorizing dynamic academic curricula that span from marine and electrical engineering to smart port operations, cybersecurity in maritime transport, and offshore renewable energy management, the Ministry ensures that Romanian graduates remain globally competitive and ready to staff emerging sectors like offshore wind and blue biotechnology.

Beyond higher education and vocational training, the Ministry of Education is actively mainstreaming ocean literacy and environmental stewardship into the national educational framework. Aligned with Romania's National Strategy for Sustainable Development 2030, the Ministry promotes "Education for Sustainable Development" (ESD) by integrating climate change, marine biodiversity, and circular economy principles directly into school curricula. Furthermore, the Ministry actively supports the integration of Romanian schools into European "blue education" frameworks—such as the EU Horizon-funded SHORE project—which funds grassroots "blue projects" in primary and secondary schools. This grassroots approach fosters a cultural shift toward ecological awareness, ensuring that the next generation of coastal citizens and maritime professionals inherently values the ecological preservation targets set forth by the Common Maritime Agenda.

Research and Academia

Romania benefits from a highly specialized scientific community that provides the critical data, technological innovation, and workforce training required to sustain and expand the blue economy. These institutions bridge the gap between regulatory mandates and industrial application, ensuring that economic growth in the Black Sea aligns with the European Green Deal and the Common Maritime Agenda.

National Institute for Marine Research and Development “Grigore Antipa” (NIMRD)

Based in Constanța, the National Institute for Marine Research and Development “Grigore Antipa” (NIMRD) is Romania's premier marine science institution and the technical operator of the national marine monitoring network, serving as the definitive scientific authority for implementing the EU Marine Strategy Framework Directive (MSFD). Within the blue economy framework, NIMRD conducts continuous oceanographic surveys to assess Good Environmental Status (GES), providing the critical environmental baseline data that offshore energy and aquaculture developers must rely on for statutory impact assessments. As the sole domestic institute conducting applied research on marine aquaculture, NIMRD is directly responsible for evaluating fish stocks to determine the Total Allowable Catch, ensuring that commercial fishing quotas allocated to the Romanian fleet remain ecologically sustainable. Furthermore, the institute drives international innovation in blue biotechnology and ecosystem conservation by actively spearheading transboundary EU Horizon Europe initiatives—such as the DOORS (Developing Optimal Black Sea Research-Infrastructures) project—to establish a unified “System of Systems” for comprehensive Black Sea observation or the BRIDGE-BS.

National Institute of Marine Geology and Geoecology (GeoEcoMar)

The National Institute of Marine Geology and Geoecology (GeoEcoMar) serves as the scientific backbone for Romania's physical maritime spatial planning and offshore resource management, focusing primarily on the geological and morphodynamic processes of the river-delta-sea continuum. A major contribution to the 2026 blue economy is GeoEcoMar's ongoing development of the “Digital Twin” of the Romanian Coastal Zone (officially driven by the GEOMARDIGITAL project). By adhering to Open Access and FAIR data principles, this innovative system integrates satellite remote sensing, new bathymetric grids, and numerical modeling, allowing policymakers and entrepreneurs to simulate coastal erosion, test the hydrodynamic impact of maritime infrastructure, and identify safe zones for economic development. Concurrently, GeoEcoMar conducts high-resolution seismo-acoustic mapping of the continental shelf to identify deep-water energy resources and potential sites for carbon capture and storage (CCS). These exhaustive geological surveys are an absolute prerequisite for the safe, structural anchoring of offshore wind turbines and the laying of subsea telecommunication and power cables, ensuring that such high-impact infrastructure does not trigger underwater landslides or disturb vulnerable benthic habitats.

Ovidius University of Constanța

As the largest multidisciplinary institution in the Dobrogea region, Ovidius University of Constanța (UOC) provides the essential academic and socio-economic framework necessary for the blue transition, acting as a regional hub for both interdisciplinary research and coastal ocean literacy. By driving advanced academic programs in marine biology, ecology, and coastal zone management, the university directly supports the preservation of the Danube Delta and the Black Sea coast. Beyond the hard sciences, UOC's economic faculties actively research the socio-economic impacts of the blue economy, focusing on the sustainable transition of coastal tourism, the valuation of marine resources as social capital, and the circular economy models required to shift local industries away from traditional “red economy” resource depletion. Highlighting its central role in regional scientific diplomacy and knowledge transfer, Ovidius University serves as the host institution for major basin-wide scientific consortiums—such as the MARBLUE 2026 International Joint Conference—bringing together global stakeholders to align fundamental marine research with technological innovations and blue growth opportunities across the Black Sea.

Constanța Maritime University (CMU)

Constanța Maritime University (CMU) serves as the specialized technical engine driving the industrial and transport sectors of Romania's blue economy. As a globally recognized maritime training institution, CMU focuses heavily on applied engineering and logistics, providing advanced degrees in navigation, naval electromechanics, and port management. Its research is aggressively geared toward maritime decarbonization, exploring alternative marine fuels, energy efficiency in shipbuilding, and smart port logistics to support the "green port" transition. To accommodate Romania's evolving energy mix, CMU offers specialized master's and doctoral programs in offshore technologies; while traditionally focused on oil and gas, these curricula are rapidly adapting to provide the structural and electrical engineering expertise required for the emerging offshore wind sector. Furthermore, CMU actively addresses the industry's skills gap by leading regional educational initiatives—such as the MENTOR project and the establishment of Blue Career Centres—designed to attract and train youth for highly specialized blue jobs, ensuring that the local labor market can fully sustain the rapid expansion of offshore energy, aquaculture, and sustainable shipping.

Other universities and research institutions

Beyond the immediate coastal zone, the "Dunărea de Jos" University of Galați (UDJG) plays an indispensable role in Romania's blue economy through its historical expertise in riverine and maritime engineering. Serving the critical Danube-Black Sea nexus, UDJG hosts Romania's only dedicated Faculty of Naval Architecture, which provides essential research on sustainable shipbuilding, hull optimization, and green propulsion systems required to decarbonize the regional maritime fleet. Concurrently, through its Faculty of Food Science and Engineering, the university is a national leader in aquaculture research. It offers specialized academic programs in aquatic bioresources and fishery industrialization, directly supporting the transition from traditional pond farming toward high-yield, environmentally sustainable recirculating aquaculture systems (RAS) that are crucial for regional food security and the alleviation of pressure on wild Black Sea fish stocks.

Operating as a cornerstone of both military and civilian maritime education in Constanța, the "Mircea cel Bătrân" Naval Academy (MBNA) provides critical academic and operational expertise to Romania's blue economy. With roots dating back to 1872, MBNA is internationally certified to train maritime officers, port management specialists, and naval engineers who directly staff the region's expanding commercial fleet and offshore industrial operations. The academy drives significant technological innovation through its two primary interdisciplinary hubs: the Research Centre in Marine Engineering and the Research Centre in Naval Engineering and Management. By actively leading and participating in transboundary EU frameworks (such as the Blue4Seas initiative and various Horizon Europe projects), MBNA focuses its applied scientific research on advanced marine electro-mechanics, automated naval equipment, and sustainable development technologies, ensuring that the Black Sea's maritime logistics and security sectors are equipped with cutting-edge, environmentally compliant engineering solutions.

A historically significant institution contributing to the region's marine research is the "Alexandru Ioan Cuza" University of Iași (UAIC), which operates the Marine Biological Station "Prof. Dr. Ioan Borcea" located in Agigea, just south of Constanța. Celebrating its centenary in 2026 as Romania's oldest marine research facility, the station serves as a crucial hub for academic training, summer internships, and applied research in marine biology, zoology, and coastal ecology. Beyond its educational mandate, the facility hosts a specialized ornithological observatory tracking Black Sea migratory routes and directly manages the "Marine Dunes of

Agigea"—a unique, strictly protected coastal habitat. Supported by significant 2026 EU-funded investments for modernization, UAIC's Agigea station plays an active role in the blue economy by providing the ecological data and biodiversity monitoring necessary to balance aggressive coastal infrastructure development with vital environmental conservation.

Although located outside the immediate coastal zone, the Technical University of Civil Engineering Bucharest (UTCB) plays a pivotal role in Romania's blue economy educational framework through its integration into the EU-CONEXUS (European University for Smart Urban Coastal Sustainability) alliance. UTCB coordinates the highly specialized "Blue Economy and Growth" academic program, which equips engineers and researchers with the interdisciplinary skills required to sustainably manage coastal and marine environments. The university's applied research explicitly targets the infrastructural pillars of the blue economy, offering advanced expertise in offshore renewable energy (wind, wave, and tidal energy extraction), sustainable coastal development, and the eco-engineering required to build climate-resilient port infrastructure. By merging civil engineering with marine biotechnology and ocean energy paradigms, UTCB bridges the gap between traditional onshore construction and the complex technical demands of Romania's expanding offshore industrial frontier.

Business support organizations

The successful transition toward a sustainable blue economy relies not only on government regulation and academic research but also on a robust commercial ecosystem. The Romanian blue economy is driven by a network of specialized business support organizations, chambers of commerce, and EU-backed accelerators that facilitate cross-sectoral cooperation, attract foreign investment, and support small and medium-sized enterprises (SMEs) in scaling marine innovations.

Romanian Maritime Cluster

The Romanian Maritime Cluster serves as a vital networking and advocacy platform that consolidates the relationships between the major industrial players in the maritime sector. Operating at the intersection of industry, academia, and public administration, the cluster focuses on increasing the competitiveness of traditional maritime sectors—such as shipbuilding, ship repair, and inland navigation—while pivoting toward emerging opportunities like offshore wind energy and green shipping. By facilitating knowledge exchange, technology transfer, and joint participation in European funding programs, the cluster helps local maritime companies integrate into global supply chains and adopt the sustainability standards required by the European Green Deal.

Chamber of Commerce, Industry, Navigation and Agriculture Constanța (CCINA)

As the primary non-governmental, public utility organization supporting the business community in the Dobrogea region, CCINA Constanța plays a critical role in the coastal blue economy. It acts as an operational bridge for maritime SMEs, port operators, and coastal tourism businesses. CCINA is highly active in fostering international business-to-business (B2B) partnerships, notably facilitating joint venture opportunities with neighboring nations (such as its strategic collaborations with the Ukrainian Maritime Cluster to stabilize and recover maritime transport). Furthermore, CCINA is a key driver of regional dialogue, hosting premier industry events like the annual *Maritime Business Week* in Constanța and connecting local entrepreneurs to blue funding frameworks like the 4BIZ (Boosting Black Sea Blue Biz) project.

Black Sea Assistance Mechanism (BSAM)

Established under the auspices of the European Commission, the Black Sea Assistance Mechanism (BSAM) is the dedicated operational arm supporting the implementation of the Common Maritime Agenda (CMA). Functioning as an executive facilitator rather than a traditional business, BSAM offers practical, hands-on support to public and private stakeholders across participating Black Sea countries. Through its National Hubs (including the Romanian Hub), BSAM provides local entrepreneurs and project leaders with essential expertise on blue economy trends, assists in the development of project ideas, and navigates complex EU funding landscapes (such as EMFAF). By fostering a cross-border network, BSAM ensures that Romanian blue tech start-ups and researchers can seamlessly find the right international partners to scale their innovations.

Blue Growth Accelerator (DOORS Project)

The Blue Growth Accelerator is a highly targeted business support framework implemented through the EU Horizon-funded DOORS (Developing Optimal and Open Research Support for the Black Sea) project. Designed specifically to translate marine science into commercial viability, the Accelerator identifies unexploited blue economy opportunities and supports early-stage entrepreneurs and start-ups in the region. It bridges the critical gap between research and market by facilitating capacity building, sharing best practices, and connecting innovators directly with investors. Whether focusing on blue biotechnology, coastal resilience solutions, or emerging concepts like Salinity Gradient Power (blue energy), the DOORS Blue Growth Accelerator ensures that scientific discoveries in the Black Sea are effectively transformed into competitive, sustainable enterprises.

Civil Society Organisations

Romania relies on an active and highly specialized civil society sector to shape marine conservation, guide sustainable coastal development, and hold the blue economy accountable. These organizations act as vital watchdogs, citizen science coordinators, and implementation partners for major EU-funded transboundary environmental initiatives.

Mare Nostrum NGO

Based in Constanța, Mare Nostrum is the most prominent domestic environmental organization dedicated exclusively to the protection of the Black Sea. The NGO is a regional leader in coordinating citizen science and cross-border initiatives—such as the EU-funded MARMAPS, BlackNETs, ANEMONE PLUS, DOORS, SHORE, or AQUATIC PLASTIC projects—which focus on joint maritime spatial planning and combating plastic pollution across the Danube-Black Sea basin. Mare Nostrum actively conducts widespread, systematic beach litter monitoring, providing the empirical data national authorities need to enforce the EU single-use plastics directive. Furthermore, it operates a highly specialized, rapid-response task force for the continuous monitoring, rescue, and rehabilitation of stranded Black Sea cetaceans (dolphins and porpoises). Also, acts as the National Hub for CMA.

WWF Romania

The World-Wide Fund for Nature (WWF) Romania plays a critical role in bridging the gap between large-scale marine conservation and the economic realities of coastal communities. The organization is a primary advocate for the expansion and strict management of Marine Protected Areas (MPAs) and actively negotiates with commercial fisheries to implement sustainable, bycatch-reducing practices. A major focal point of WWF Romania's work in the river-delta-sea continuum is the protection of critically endangered Black Sea sturgeon populations. By

combating illegal poaching, monitoring migration routes along the lower Danube, and securing funding for alternative economic livelihoods in traditional fishing villages, WWF ensures that ecological preservation remains an integral, socially equitable component of regional development.

Oceanic Club

The Oceanographic Research and Marine Environment Protection Society "Oceanic-Club" provides essential technical and field support for marine biodiversity monitoring. Equipped with advanced mobile laboratories, drones, and Remotely Operated Vehicles (ROVs), the Oceanic Club conducts high-resolution underwater surveys and independent environmental impact assessments. They are heavily involved in mapping benthic habitats, tracking the spread of invasive species, and maintaining an active response capacity for oiled wildlife care and marine rescue. Their hands-on scientific expeditions supply both public authorities and private developers with the crucial, localized data required to navigate the ecological complexities of offshore development.

Society for Protection of Birds and Nature (SPN) / Romanian Ornithological Society (SOR)

Because the Romanian coastline and the Danube Delta form one of Europe's most critical bottlenecks for avian migration (the *Via Pontica* flyway), ornithological NGOs are vital to the blue economy's spatial planning. These organizations conduct continuous, rigorous monitoring of pelagic and coastal bird populations. In the current context of rapid offshore renewable energy expansion, their environmental data is indispensable. Both government regulators and energy developers rely heavily on their long-term baseline studies to safely site offshore wind turbines and subsea cable landfalls, ensuring that new green infrastructure does not disrupt coastal nesting habitats or cause high mortality events among vulnerable migratory flocks.

Black Sea Advisory Council (BISAC)

The Black Sea Advisory Council (BISAC) is a vital, EU-mandated regional stakeholder platform that bridges the gap between commercial maritime industries, civil society, and policymakers. Established under the framework of the EU's Common Fisheries Policy (CFP), BISAC operates as a consultative body providing direct recommendations to the European Commission and member states (specifically Romania and Bulgaria) on the sustainable management of Black Sea fisheries and aquaculture. Its structure inherently enforces a balance of interests, with its general assembly and executive committee mandating a strict 60/40 allocation of seats: 60% dedicated to industry representatives (commercial fishers, aquaculture operators, and processing sectors) and 40% reserved for other interest groups, notably environmental NGOs and consumer advocacy organizations. By facilitating this consensus-driven dialogue, BISAC plays a critical role in the blue economy, ensuring that top-down regulatory frameworks—such as fishing quotas (TACs), the protection of critically endangered sturgeon, and the transition toward eco-friendly aquaculture—are grounded in the practical realities of coastal communities and the technical expertise of marine conservationists.

Fisheries Local Action Groups (FLAGs)

A distinct and highly critical component of Romania's blue economy governance is the network of Fisheries Local Action Groups (FLAGs), known in Romania as *Grupuri de Acțiune Locală pentru Pescuit*. Operating at the intersection of public administration, private enterprise, and civil society, FLAGs are the primary mechanism for implementing Community-Led Local Development (CLLD) strategies across coastal and inland fishing zones.

FLAG Dobrogea Nord covers the northern stretch of the Romanian coastline and inland waters, extending from the Port of Constanța northward through Năvodari, Corbu, and up to the rural communities bordering the Danube. Its role is highly focused on modernizing both marine fishing and inland aquaculture while safeguarding vulnerable coastal ecosystems. This FLAG acts as a critical financial catalyst for modernizing commercial fishing fleets and supporting processing facilities. Furthermore, it actively partners with local academia—such as the Constanța Maritime University (CMU)—to fund essential environmental research, including comprehensive water quality assessments to ensure that the expansion of the local fishing sector does not compromise the ecological balance of the Black Sea and adjacent transitional waters.

FLAG Dobrogea Sud operates across the southern coastal tier, encompassing key maritime municipalities like Mangalia, Eforie, and Agigea, as well as rural inland communes extending westward toward the Danube. The primary role of this FLAG is to drive the socio-economic diversification of traditional fishing communities, helping them pivot from declining wild-catch revenues toward sustainable "blue tourism" and local gastronomy. By providing targeted grants, FLAG Dobrogea Sud empowers local fishers to develop direct-to-consumer fish markets, modernize small-scale landing infrastructure, and create eco-tourism experiences (such as pescaturism). In doing so, it preserves the cultural heritage of the Dobrogea region while embedding circular economy principles and sustainable coastal management directly into the local business fabric.

Legal and Strategic Framework

EU-Level Framework

Romania's transition toward a sustainable maritime sector is fundamentally governed by a complex EU-Level Framework designed to align national economic interests with the European Green Deal and the overarching EU Sustainable Blue Economy Strategy.

At the regional level, this is driven by the Common Maritime Agenda for the Black Sea (CMA) and its scientific pillar, the Strategic Research and Innovation Agenda (SRIA), which dictate cross-border cooperation, funding mechanisms, and shared blue growth priorities among basin nations. Operationally, the expansion of Romania's blue economy is strictly bound by European directives. The Maritime Spatial Planning (MSP) Directive regulates how marine space is allocated, resolving conflicts between offshore energy, maritime transport, and marine protected areas. Concurrently, the Marine Strategy Framework Directive (MSFD) mandates continuous environmental monitoring to achieve Good Environmental Status (GES) across the coastal zone. Finally, traditional sectors are tightly managed under the Common Fisheries Policy (CFP), which enforces sustainable quotas and promotes the transition toward eco-friendly aquaculture.

Common Maritime Agenda for the Black Sea (CMA)

CMA is the fundamental sea-basin initiative driving regional cooperation for a sustainable blue economy. Endorsed in 2019 by Romania and six other Black Sea nations with the backing of the European Commission, the CMA provides the strategic roadmap for balancing maritime economic growth with environmental preservation. It focuses on three core goals: ensuring healthy marine and coastal ecosystems, building a competitive and innovative blue economy, and fostering targeted investments. Supported operationally by the Black Sea Assistance Mechanism (BSAM) and scientifically by the Strategic Research and Innovation Agenda (SRIA), the CMA serves as the regional framework that enables Romania to align its national maritime priorities—such as

offshore wind energy, sustainable aquaculture, and green port logistics—with broader European sustainability targets and cross-border funding opportunities.

The Maritime Spatial Planning (MSP) Directive (Directive 2014/89/EU)

MSP Directive provides the legal framework for organizing human activities in marine areas to achieve ecological, economic, and social objectives. Transposed into Romanian legislation and resulting in the adoption of Romania's first Maritime Spatial Plan in late 2023, the directive acts as the master zoning blueprint for the national blue economy. It is designed to resolve spatial conflicts between competing sectors—such as offshore wind energy developers, commercial maritime transport, traditional fisheries, and marine protected areas (MPAs). By mandating an ecosystem-based approach and cross-border cooperation (particularly with Bulgaria), the MSP Directive ensures that the rapid industrialization of Romania's Exclusive Economic Zone (EEZ) does not compromise marine biodiversity or the safety of established shipping lanes.

The Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC)

MSFD Directive functions as the primary environmental safeguard for Romania's blue economy, designed to achieve and maintain Good Environmental Status (GES) across the Black Sea. Transposed into national legislation and technically monitored by the National Institute for Marine Research and Development (NIMRD), the MSFD mandates a rigorous, ecosystem-based approach to managing human activities at sea. By continuously evaluating 11 critical environmental descriptors—ranging from marine biodiversity and seafloor integrity to underwater noise and marine litter—the directive ensures that the expansion of maritime transport, offshore renewable energy, and coastal tourism does not exceed the ecological carrying capacity of the marine environment. Consequently, any major blue economy development in Romania's Exclusive Economic Zone must strictly align with MSFD compliance, ensuring that industrial and economic growth remains fundamentally decoupled from marine degradation (Boicenco et. al, 2018).

The Common Fisheries Policy (CFP)

This is the EU's primary regulatory instrument for managing European fishing fleets and conserving marine biological resources. For Romania, the CFP provides the strict legal framework necessary to balance the economic viability of traditional Black Sea fisheries with urgent ecological recovery. Implemented nationally through the National Agency for Fisheries and Aquaculture (ANPA), the policy enforces science-based Total Allowable Catches (TACs) and fishing quotas for key commercial species like turbot and sprat, fundamentally shifting the industry away from historical over-exploitation. Beyond wild-catch regulations, the CFP actively drives the transition toward sustainable aquaculture—simplifying administrative procedures to promote modern recirculating aquaculture systems (RAS) and marine farming—while mandating the protection of vulnerable ecosystems through the reduction of bycatch and the strict enforcement of the landing obligation.

EU Sustainable Blue Economy Strategy

The EU Sustainable Blue Economy Strategy is the European Commission's overarching framework designed to transition maritime industries away from unmitigated "blue growth" toward a deeply sustainable, climate-neutral model aligned with the European Green Deal. For Romania,

this strategy fundamentally dictates how the nation modernizes its Black Sea and Danube Delta operations. It mandates the decarbonization of major logistics hubs like the Port of Constanța, the pivot toward circular economy models in coastal tourism and shipbuilding, and the expansion of emerging sectors such as offshore renewable energy and blue biotechnology. By explicitly linking economic development to the restoration of marine biodiversity and climate resilience, the strategy provides the regulatory blueprint and critical funding avenues (such as the Sustainable Blue Economy Partnership and EMFAF) that allow Romania to simultaneously exploit and protect its maritime resources.

European Green Deal

The European Green Deal serves as the overarching macroeconomic and environmental framework driving Romania's blue transition, legally binding the nation to achieve climate neutrality by 2050. Within the maritime sector, the Deal—supported by the "Fit for 55" legislative package and recent directives like FuelEU Maritime—mandates the rapid decarbonization of shipping, port logistics, and coastal industries. For Romania, this translates into a massive operational pivot: transforming the Port of Constanța into a "green port" hub, accelerating the deployment of Black Sea offshore renewable energy to replace fossil fuels, and enforcing circular economy principles across traditional sectors like shipbuilding and aquaculture. Ultimately, the Green Deal acts as both a strict regulatory baseline and a massive funding catalyst, ensuring that the industrial expansion of Romania's blue economy is fundamentally decoupled from carbon emissions and ecological degradation.

Strategic Research and Innovation Agenda (SRIA) for the Black Sea

The Strategic Research and Innovation Agenda (SRIA) for the Black Sea serves as the critical scientific pillar of the Common Maritime Agenda (CMA). Launched in 2019, with its comprehensive Implementation Plan rolled out in 2023, the SRIA provides the foundational roadmap for translating marine science into sustainable economic growth. It focuses on four core pillars: addressing fundamental research challenges (such as multi-stressor impacts and biodiversity loss), boosting the blue economy, developing innovative research infrastructures (like the Digital Twin of the Black Sea), and empowering a specialized blue workforce through education. For Romania, the SRIA is indispensable; it aligns national academic institutions and research frameworks with broader EU priorities, ensuring that the country's blue economy transition—from sustainable aquaculture to offshore energy—is driven by evidence-based policymaking, cross-border scientific collaboration, and targeted European funding mechanisms like Horizon Europe.

Sustainable Blue Economy Partnership (SBEP)

Operating under the Horizon Europe program, the Sustainable Blue Economy Partnership (SBEP) is a massive, co-funded initiative bringing together 74 partner institutions across 30 countries. It is designed to pool research and innovation investments at a pan-European scale to deliver a climate-neutral, sustainable, and productive blue economy by 2030. For member states like Romania, the SBEP acts as a critical bridge, aligning national marine research agendas with transboundary sea-basin strategies (including the Black Sea) to fund large-scale projects in digital ocean twins, blue bioresources, and resilient coastal communities.

Bucharest Convention

The Bucharest Convention (formally the *Convention on the Protection of the Black Sea Against Pollution*) is the foundational legal framework for regional environmental cooperation among all six Black Sea coastal states. Adopted in 1992 and managed by the Black Sea Commission, the Convention legally obligates its signatories—including Romania—to prevent, reduce, and control marine pollution stemming from land-based sources, maritime transport, and offshore industrial activities. Within the context of the blue economy, the Bucharest Convention serves as the critical transboundary safeguard for regional maritime expansion. It ensures that as Romania scales its offshore energy sectors, modernizes its ports, and expands commercial shipping, these industrial activities comply with strict, basin-wide protocols on emergency oil spill response, hazardous waste dumping, and biodiversity conservation. Ultimately, it guarantees that aggressive, unilateral economic development does not lead to the ecological collapse of the shared Black Sea environment.

EU Ports Strategy

Adopted in March 2026, the EU Ports Strategy provides a comprehensive framework to secure the strategic autonomy, competitiveness, and sustainability of European ports as they evolve from traditional transport nodes into critical digital and green-energy hubs. The strategy mandates the rapid decarbonization of maritime logistics through an Electrification Action Plan and the development of multi-fuel facilities, while strictly safeguarding infrastructure against cyber threats, organized crime, and high-risk foreign ownership. By streamlining access to EU funding and launching a dedicated Pact for Skills to reskill the maritime workforce, the strategy equips member states to navigate the complex demands of the Green Deal. For Romania, this framework serves as the exact regulatory and financial blueprint required to transform the Port of Constanța and the Danube river-maritime network into highly secure, zero-emission gateways that anchor the nation's expanding blue economy.

EU Biodiversity Strategy for 2030

The EU Biodiversity Strategy for 2030, a core pillar of the European Green Deal, establishes a comprehensive, long-term blueprint to reverse the degradation of marine ecosystems and pivot the maritime sector toward a "nature-positive" blue economy. This strategy shifts the economic paradigm from simple resource extraction to a model where marine industries must actively contribute to ocean regeneration. For Romania, this framework mandates that expanding sectors—such as Black Sea offshore wind energy, coastal tourism, and commercial shipping—are strictly managed to ensure they do not disrupt critical marine food webs, accelerate habitat fragmentation, or compromise ecological resilience.

The Birds and Habitats Directives & Marine Protected Areas (MPAs)

The structural backbone of biodiversity protection in Romania's Exclusive Economic Zone (EEZ) is formed by the Habitats Directive (Directive 92/43/EEC) and the Birds Directive (Directive 2009/147/EC), which jointly govern the designation of the marine Natura 2000 network. The EU Biodiversity Strategy sets an ambitious target to legally protect at least 30% of European seas by 2030, with 10% under strict protection. Romania has achieved excellent baseline progress in this arena, with its marine protected area (MPA) coverage reaching approximately 21.4% of its marine waters—significantly outpacing the current EU average of 13.7%. These designated sites protect vital benthic (seafloor) habitats, marine reefs, and pelagic bird populations along the critical *Via Pontica* migration flyway, requiring all blue economy developers to undergo rigorous Environmental Impact Assessments (EIAs) before initiating offshore operations.

The EU Nature Restoration Regulation

Moving beyond passive conservation, the landmark EU Nature Restoration Regulation introduces legally binding targets to actively restore degraded ecosystems across at least 20% of the EU's land and sea areas by 2030, and all ecosystems in need of restoration by 2050. Under this framework, Romania faces a critical regulatory milestone, with a deadline to submit its comprehensive National Restoration Plan to the European Commission. For the Romanian Black Sea, this mandates active, state-backed interventions to rehabilitate degraded marine habitats, such as vital seagrass beds and sediment bottoms, which serve as essential carbon sinks and fish nurseries. Furthermore, it enforces strict recovery measures for iconic, vulnerable Black Sea species, including migratory seabirds and the region's three protected cetacean species (the harbor porpoise, common dolphin, and bottlenose dolphin), effectively restricting high-impact industrial activities or unsustainable fishing gear in active restoration zones.

The Renewable Energy Directive (RED III)

The Revised Renewable Energy Directive (RED III - Directive (EU) 2023/2413) is the regulatory engine driving Romania's rapid legal and infrastructural pivot toward Black Sea energy. Spurred by RED III's aggressive mandate to achieve a 42.5% share of renewable energy across the bloc by 2030, Romania enacted its landmark Offshore Wind Energy Law in 2024. Throughout 2025 and 2026, the Ministry of Energy has been actively executing the technical studies required to officially delineate offshore wind concession blocks. RED III directly impacts the blue economy by establishing "Renewables Acceleration Areas," which fast-track permitting for offshore wind installations while ensuring that strict environmental criteria are maintained under the Maritime Spatial Plan.

The Port Reception Facilities (PRF) Directive

To combat the persistent challenge of sea-based pollution and illegal dumping in the Black Sea, the Port Reception Facilities Directive (Directive (EU) 2019/883) introduces strict rules on how waste from ships is handled. The directive enforces a "100% indirect fee" system, meaning that every vessel calling at a Romanian port must pay a flat waste fee regardless of whether they deliver waste or not. This clever economic mechanism removes any financial incentive for ship captains to illegally discharge garbage, oily bilge water, or cargo residues into the open sea. For Romanian port administrations, it mandates a continuous upgrade of reception facilities to safely collect, sort, and integrate ship-generated waste into regional circular economy loops.

European Strategy for Plastics and the Blue Economy

The 2018 European Strategy for Plastics in a Circular Economy aims to replace the linear "take-make-dispose" model with a closed-loop system, mandating that all plastic packaging on the EU market be reusable or recyclable by 2030. By enforcing bans on single-use plastics and expanding producer responsibilities, the strategy acts as a critical defensive measure for the blue economy—the sustainable use of ocean and freshwater resources. Because most marine litter originates on land, keeping plastics within the economy prevents the degradation of aquatic ecosystems, thereby safeguarding the foundational capital required for maritime industries like coastal tourism, fisheries, and aquaculture to thrive.

For Romania, accelerating the adoption of this strategy is vital to protecting its primary blue economy assets: the Danube River basin and the Black Sea coastline. Currently, low national recycling rates and mismanaged municipal waste result in significant quantities of plastic debris flowing down the Danube and into the Black Sea. To secure the long-term profitability and ecological health of its maritime sectors, Romania must overcome infrastructural barriers,

modernize waste collection, and strictly enforce EU plastic regulations to stem the flow of pollution into these critical interconnected waterways.

Water Framework Directive (WFD)

The Water Framework Directive (WFD) is the cornerstone of EU water policy, established in 2000 to manage water bodies holistically through river basin districts rather than administrative borders. Its primary objective is to ensure that all surface and groundwaters achieve at least "good" ecological and chemical status, mandating that member states prevent deterioration and restore degraded ecosystems. Within the blue economy, the WFD serves as the critical regulatory backbone; by enforcing high standards for water quality, it protects the biological health of marine and freshwater environments. This is essential for the sustainability of blue economy sectors like coastal tourism, commercial fisheries, and aquaculture, which rely entirely on clean, functioning aquatic habitats to remain productive and resilient.

For Romania, the WFD is instrumental in governing the complex Danube-Black Sea macrosystem, which forms the core of its blue economy. Implementing these standards is a significant challenge, requiring extensive modernization of wastewater treatment, pollution control, and water management infrastructure to meet EU compliance. Successfully aligning with the WFD is not merely a bureaucratic requirement but a strategic necessity: improving water quality in the Danube and its Delta directly safeguards the long-term viability of Romania's maritime industries. By restoring the natural flow and purity of these water bodies, Romania can protect its natural capital and unlock new opportunities for "blue innovation" and sustainable growth.

Integrated Pollution Prevention and Control (IPPC) Directive

The Integrated Pollution Prevention and Control (IPPC) Directive—now subsumed under the broader Industrial Emissions Directive (IED)—establishes a comprehensive EU framework to minimize industrial pollution at its source. It mandates that large industrial and agricultural facilities adopt Best Available Techniques (BAT) to prevent or significantly reduce harmful emissions to air, water, and soil. Within the context of the blue economy, this regulatory mechanism acts as a crucial shield against chemical, heavy metal, and thermal pollution. By strictly controlling industrial effluents before they enter river systems or coastal zones, the directive preserves the baseline water quality and marine biodiversity essential for vulnerable blue economy sectors like aquaculture, commercial fisheries, and maritime tourism to safely flourish.

For Romania, enforcing IPPC standards is critical to addressing the environmental legacy of its historically heavy industrial sector. Many large-scale manufacturing, petrochemical, and agricultural operations are situated along the Danube River basin and near the Black Sea coast, historically posing a direct contamination risk to these interconnected waters. By mandating industrial modernization and enforcing stricter effluent controls, Romania can prevent toxic industrial runoffs from reaching the environmentally sensitive Danube Delta and Black Sea. Ensuring that coastal and riverside industries comply with these stringent EU emission standards is vital for protecting the biological integrity of Romania's aquatic ecosystems, thereby securing the long-term economic viability of its maritime industries.

EU Mission: Restore our Ocean and Waters by 2030

The EU Mission: Restore our Ocean and Waters by 2030 is a flagship initiative under the Horizon Europe program designed to holistically repair marine and freshwater ecosystems. Moving beyond traditional policy frameworks, the Mission employs a systemic approach focused on three core objectives: protecting biodiversity, eliminating pollution, and transitioning the blue economy toward carbon neutrality and circularity. To operationalize these goals, the initiative establishes regional "Lighthouses"—living laboratories set up in major sea and river basins that pilot, demonstrate, and deploy innovative, science-based solutions. By mobilizing targeted investments, research, and citizen engagement, the Mission actively restores the environmental baseline required to sustain commercial maritime industries over the long term.

For Romania, this initiative is transformative due to its central role in the Danube-Black Sea Lighthouse, which was officially launched in Bucharest in 2023. By addressing the river basin and the sea as one interconnected system, the Mission directly targets the transboundary pollution and habitat degradation threatening Romania's coastal and freshwater assets. In 2024, Romania officially endorsed the Mission's Charter, committing to concrete national actions to restore these waters. Through funded innovation projects and regional collaboration, this framework provides Romania with the technical and financial support needed to modernize its aquatic governance, implement nature-based solutions, and secure the ecological foundation upon which its entire national blue economy—from Danube fisheries to Black Sea tourism—depends.

National Blue economy strategies and frameworks

While Romania does not possess a singular, standalone "Blue Economy Strategy" document, its domestic governance is structured around a highly coordinated matrix of sector-specific national laws, strategic blueprints, and governmental programs that operationalize the transition toward a sustainable maritime economy. This domestic framework is overarchingly anchored by Romania's National Sustainable Development Strategy 2030 (NSDS), which explicitly translates United Nations SDG 14 (Life Below Water) into national law to align the country's economic development with the ecological preservation of the Black Sea and the Danube Delta continuum.

Romania's National Sustainable Development Strategy 2030 (NSDS)

Adopted via Government Decision 877/2018 and operationally reinforced by a national action plan in 2022 (GD 754/2022), Romania's National Sustainable Development Strategy 2030 (NSDS) serves as the primary macro-policy framework governing the country's transition toward a green and resilient economy. Coordinated directly by the Department of Sustainable Development within the Prime Minister's Office, the NSDS functions as an umbrella strategy that infuses environmental, economic, and social benchmarks across all national ministries. Within the specific context of the blue economy, the strategy explicitly translates United Nations Sustainable Development Goal 14 (SDG 14: Life Below Water) into Romania's domestic legal and planning framework, focusing heavily on protecting the delicate river-delta-sea continuum. Progress under this framework is evaluated transparently through "Sustainable Romania," a central open-data dashboard managed by the National Institute of Statistics (INS) that tracks 292 specific sustainable indicators to ensure public and institutional accountability.

To successfully decouple maritime industrial growth from ecological decline, the NSDS outlines comprehensive targets for environmental preservation, beginning with a heavy focus on mitigating land-based marine pollution. Because Romania sits at the terminal discharge point of the massive Danube River basin, the strategy prioritizes reducing upstream agricultural nutrient runoff—the primary driver of marine eutrophication (excessive algae growth that suffocates marine life)—and curbing plastic debris density along the Black Sea coastline. Concurrently, the NSDS establishes

strict mandates to protect vulnerable species and habitats, directing national resources toward conservation plans for endangered Black Sea cetaceans like dolphins and porpoises, while ensuring that modern maritime expansion does not disrupt coastal reefs or the migratory paths of critically endangered Danube sturgeon.

Beyond habitat protection, the strategy provides the necessary policy baseline to transition toward sustainable fisheries and dramatically advance marine science. In close alignment with European Union mandates, the NSDS legally enforces science-based management plans to eliminate overfishing and curb Illegal, Unreported, and Unregulated (IUU) fishing practices within Romania's Exclusive Economic Zone (EEZ), working to restore wild fish stocks while safeguarding the economic rights of small-scale, artisanal coastal fishers. Recognizing that a sustainable blue economy depends entirely on robust data, the framework also explicitly commits to increasing national marine research budgets, boosting cross-border scientific cooperation, and leveraging the specialized expertise of bodies like the National Institute for Marine Research and Development (NIMRD) "Grigore Antipa" to create evidence-based maritime policies.

Rather than remaining a static policy document, the NSDS serves as the foundational philosophical and legal justification for Romania's more granular, sector-specific maritime laws. The baseline environmental thresholds and sustainability metrics anchored in this strategy directly informed the drafting and execution of recent monumental achievements, such as the legally binding Maritime Spatial Plan and the Offshore Wind Energy Law. By embedding these strict sustainable development metrics directly into national budgetary planning and legislative frameworks, the NSDS ensures that major new infrastructure initiatives—such as the green transition of the Port of Constanța or deep-sea energy projects—are fundamentally balanced against the long-term ecological preservation of the Black Sea.

Romanian Maritime Spatial Plan

The Romanian Maritime Spatial Plan (PASM — Planul de Amenajare a Spațiului Marin) was officially enacted into law on November 10, 2023, under Government Ordinance no. 97/2023. This milestone legislative achievement was the culmination of years of intensive transboundary scientific research and public consultations, heavily supported by the European Commission's DG MARE through the MARSPLAN-BS I and II projects. The plan establishes a binding legal framework over a massive maritime territory of approximately 30,000 square kilometers, which encompasses Romania's Territorial Sea (out to 12 nautical miles), its Contiguous Zone, and its full Exclusive Economic Zone within the Black Sea. By replacing an ad-hoc, reactive licensing approach with a single statutory blueprint, the PASM converts abstract marine space into a clearly structured, regulated, and legally stable domain.

To manage this complex space, the execution of the plan is overseen by a high-level inter-ministerial Maritime Spatial Planning Committee. Coordinated directly under the Prime Minister's office, this committee unites key administrative bodies—including the Ministries of Energy, Environment, Transport, and National Defense—to resolve spatial and temporal conflicts before they can stall economic development. The plan explicitly maps out zoning lines that successfully de-conflict the Romanian Black Sea by keeping high-traffic commercial shipping lanes feeding into the Port of Constanța physically separate from critical military exercise zones designated for national security. Furthermore, it carefully balances established fossil-fuel extraction networks—such as the multi-billion-euro Neptun Deep gas project—with emerging offshore wind acceleration blocks, while simultaneously marking traditional commercial fishing corridors to prevent small-scale artisanal fishers from being pushed out by heavy industrial offshore infrastructure.

A core pillar of the PASM is its strict adherence to an ecosystem-based approach, which maps out and legally respects Romania's extensive network of Marine Protected Areas (MPAs). With

over 21% of its marine waters designated under protection—predominantly through the EU Natura 2000 network—the plan explicitly marks off-limits or highly restricted zones to safeguard vulnerable benthic reefs, underwater seagrass beds, and pelagic bird migration pathways along the critical *Via Pontica* flyway. By hardcoding these ecological boundaries directly into the national zoning map, the plan completely eliminates regulatory ambiguity. For blue economy investors, particularly international consortia looking to back large-scale offshore wind farms, green hydrogen facilities, or advanced aquaculture ventures, this extreme spatial clarity dramatically de-risks capital allocation by allowing them to fast-track environmental licensing and site selection with long-term legal and financial predictability.

Offshore Wind Energy Law

Promulgated as Law no. 121/2024, Romania's first comprehensive Offshore Wind Energy Law marks a decisive milestone under the National Recovery and Resilience Plan (NRRP), positioning the nation to tap into an estimated 76 to 94 gigawatts (GW) of technical wind potential in the Black Sea. The framework establishes the Ministry of Energy as the competent granting authority, charging it with the strategic goal of installing at least 3 GW of offshore wind capacity by 2035. To maintain strict alignment with Romania's Maritime Spatial Plan, any designated offshore perimeters must systematically respect predefined prohibited zones, commercial shipping lanes, traditional fishing grounds, and sensitive Natura 2000 marine protected areas, ensuring the industrial deployment coexists harmoniously with the surrounding marine ecosystem.

Financially, the law leverages the highly anticipated Contracts for Difference support scheme—a state aid mechanism designed to shield developers from market volatility by guaranteeing a predictable strike price for electricity generated over a multi-decade horizon. Operationally, the regulatory architecture is multi-tiered: the Ministry of Energy oversees competitive bidding and signs the exploration and exploitation concession contracts, while the Competent Authority for Regulating Offshore Black Sea Petroleum Operations (ACROPO) handles the crucial development approvals (the legal equivalent of a maritime construction permit). Concurrently, the National Energy Regulatory Authority remains responsible for granting production licenses, and the transmission system operator, Transelectrica, manages the massive grid absorption and infrastructure adjustments needed to connect the offshore grid to the mainland.

Moving from legislation to implementation, the Ministry of Energy launched specialized technical and bathymetric studies to formally delineate the exact maritime blocks available for concession. These assessments focus heavily on analyzing seabed structures for fixed or floating foundations, mapping localized wind speeds, and planning subsea cable routes capable of handling high-voltage direct current (HVDC) transmission. Given the logistical complexity of upgrading onshore grid substations and modernizing the Port of Constanța to handle the assembly of giant turbine components, energy policy pathways project that the first commercial megawatts from these Black Sea perimeters will officially integrate into the National Energy System by 2032.

Emergency Ordinance (OUG) no. 71/2010 on the establishment of the strategy for the marine environment

The core legislative engine executing the Marine Strategy Framework Directive (MSFD) in Romania is Emergency Ordinance (OUG) no. 71/2010 on the establishment of the strategy for the marine environment (approved and sequentially updated by subsequent laws, including Law no. 6/2011 and Law no. 279/2018). This statutory framework formally tasks the central public authority for water management—closely supported by the technical expertise of the National Institute for Marine Research and Development (NIMRD) "Grigore Antipa"—with drafting,

monitoring, and updating Romania's comprehensive Marine Strategy. By legally binding industrial and maritime operations to strict environmental thresholds, OUG 71/2010 requires the continuous evaluation of the Black Sea's qualitative descriptors (such as hydrographic changes, underwater noise, contaminants, and marine litter) to actively maintain Good Environmental Status (GES) within Romania's Exclusive Economic Zone (EEZ).

Table 1 - Core national legislation

Core national legislation	Primary regulatory function	Direct operational impact on blue economy
Government Ordinance no. 97/2023 <i>(Approving the National Maritime Spatial Plan)</i>	Transposes Directive 2014/89/EU into enforceable domestic zoning maps.	Establishes fixed boundaries for industrial shipping lanes, military exercises, offshore energy concessions, and marine protected areas.
Law no. 88/2017 <i>(Amending GO 18/2016 on MSP Architecture)</i>	Sets up the permanent multi-agency structural framework for the national MSP Committee.	Organizes regular inter-ministerial reviews to update maritime spatial maps based on changing economic demands.
Emergency Ordinance no. 71/2010 <i>(Strategy for the Marine Environment)</i>	Transposes the Marine Strategy Framework Directive (MSFD) into national environmental law.	Mandates strict environmental monitoring and sets pollution limits for industrial projects operating in marine waters.
Government Decision no. 432/2020 <i>(Program of Measures for Black Sea GES)</i>	Outlines specific corrective actions to achieve Good Ecological Status.	Regulates agricultural runoff, sets plastic waste recovery rules, and manages noise pollution to protect native cetaceans.

Law no. 121/2024 <i>(The Offshore Wind Energy Act)</i>	Establishes the legal system for off-shore wind development in the Black Sea.	Empowers ministries to award spatial concessions, issue environmental permits, and set up grid-connection terms for energy developers.
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National blue economy strategies and policies

The sustainable development of the blue economy is fundamentally dependent on the ecological health and resilience of marine and freshwater environments. To safeguard these critical assets, the European Union has established a comprehensive regulatory architecture—ranging from water quality directives and industrial pollution controls to circular economy strategies and ambitious restoration missions—designed to halt environmental degradation and mandate sustainable resource management. For member states like Romania, whose maritime livelihood is anchored by the vital Danube-Black Sea macrosystem, transposing these broad European mandates into actionable national frameworks is both a legal obligation and an economic imperative. By aligning domestic legislation with EU standards, Romania aims to combat systemic threats such as land-based plastic pollution and industrial effluent, thereby preserving the foundational natural capital required for its coastal and inland maritime industries to sustainably thrive.

Romania's Strategy for the Transition to a Circular Economy 2030 (ROCES 2030)

To align with the European Strategy for Plastics and the broader EU Circular Economy Action Plan—which is vital for reducing the flow of marine litter—Romania has formalized its commitment through Romania's Strategy for the Transition to a Circular Economy 2030 (ROCES 2030). Adopted to move the nation away from the traditional, highly polluting "extract-produce-consume-dispose" linear model, ROCES 2030 serves as the definitive national roadmap for resource efficiency. The strategy pinpoints the economic sectors with the highest potential for circularity and the greatest current environmental footprints, placing a heavy emphasis on packaging, consumer goods, and water and wastewater management. By setting aggressive national targets for reducing single-use plastics and increasing the incorporation of secondary raw materials, the framework aims to stop plastic leakage at its source before it ever reaches vulnerable aquatic environments.

A defining pillar of ROCES 2030 explicitly addresses water reuse and purification, formally recognizing the intrinsic link between onshore municipal waste management and the ecological health of the Danube-Black Sea macrosystem. In Romania, historically low recycling rates and inadequate municipal wastewater infrastructure have allowed significant volumes of microplastics, untreated effluents, and macro-plastic debris to wash downstream into the sea. To combat this, the strategy prioritizes the accelerated expansion and modernization of drinking water and sewage networks, alongside the deployment of advanced filtration systems capable of capturing plastic pollutants. By treating water as a valuable resource to be recirculated rather than a vector for waste disposal, the strategy aims to restore a controlled, efficient, and clean water cycle that directly shields coastal and marine habitats from land-based pollution.

Danube-Black Sea Lighthouse

The Danube-Black Sea Lighthouse, officially launched in Bucharest in 2023, serves as the regional operational engine for the EU Mission: Restore our Ocean and Waters. Rather than functioning as a traditional legislative directive, it acts as a dynamic governance and funding mechanism that unites researchers, policymakers, and private industry to pilot and scale actionable environmental solutions. The Lighthouse targets the interconnected river-sea macrosystem by deploying nature-based interventions—such as wetland restoration, advanced pollution filtration, and innovative sediment management—to eliminate transboundary pollution and restore degraded aquatic habitats. Within the context of the blue economy, this initiative is highly transformative. It recognizes that maritime industries cannot thrive in compromised environments; by aggressively repairing the ecological baseline, the Lighthouse protects and regenerates the natural capital necessary to sustain commercial fisheries, coastal tourism, and sustainable aquaculture.

For Romania, the Lighthouse provides both the financial backing and the collaborative framework needed to modernize its maritime sectors and protect its vital aquatic assets: the Danube Delta and the Black Sea coastline. Through funded "living labs" and innovation actions—such as the *DaWetRest* and *EcoDaLLi* projects—Romania is actively testing sustainable land and water use strategies directly within its river and coastal communities. Crucially, the Lighthouse bridges the gap between conservation and economic growth by incentivizing local enterprises, start-ups, and SMEs to pioneer "blue innovations," ranging from green shipping logistics to eco-friendly aquaculture technologies. By positioning regions like Tulcea and the broader Delta as European hubs for aquatic resilience, Romania leverages this framework to transition its local blue economy toward carbon neutrality, turning environmental restoration into a direct catalyst for sustainable, long-term maritime profitability.

Romania's National Sustainable Development Strategy 2030 (SNDD 2030)

Romania's National Sustainable Development Strategy 2030 (SNDD 2030) was adopted in 2018 to align the country's domestic policies with the United Nations' 2030 Agenda. Within this comprehensive framework, Goal 14: Life Below Water serves as the primary policy pillar governing the sustainable management of the nation's aquatic resources. This goal explicitly targets the conservation and sustainable use of oceans, seas, and marine ecosystems, operating on the principle that the ecological health of water bodies like the Black Sea and the Danube River is inextricably linked to long-term economic prosperity. By legally committing to these UN targets, Romania is tasked with establishing a resilient framework that prevents marine degradation while fostering "blue growth."

For the Romanian blue economy, Goal 14 dictates a strict balancing act between economic expansion and environmental preservation, particularly along the country's 245 kilometers of Black Sea coastline. A major priority of the strategy is the prevention and significant reduction of marine pollution, with a specific focus on land-based activities, nutrient runoff, and plastic debris. This is a critical intervention for Romania; historically, agricultural runoff and mismanaged municipal waste flowing down the Danube have led to eutrophication—spawning algae blooms and hypoxic "dead zones" in the Black Sea that suffocate marine habitats. By mandating the protection and restoration of these coastal and marine ecosystems, the strategy acts as a protective shield for the foundational assets of the tourism and fishing industries, ensuring that coastal real estate, port expansions, and tourism developments do not degrade the pristine environments that make those industries profitable.

Furthermore, Goal 14 places a strong emphasis on sustainable fishing practices, which is vital for modernizing Romania's traditional maritime sectors. The strategy demands the effective

regulation of commercial harvesting and strict interventions against overfishing, as well as illegal, unreported, and unregulated (IUU) fishing practices in both the Black Sea and the Danube Delta. By advocating for science-based fisheries management and the expansion of marine protected areas, the objective is to allow depleted fish stocks to recover to levels that can produce maximum sustainable yields. For the local blue economy, this represents a necessary transition from short-term resource exploitation to long-term economic resilience, ensuring that local fishing communities and the growing aquaculture sector can maintain their livelihoods without compromising the biological diversity required for future generations.

Master Plan for the Protection of the Coastal Zone against Erosion

The Master Plan for the Protection of the Coastal Zone against Erosion is a massive, EU-funded engineering initiative designed to secure Romania's Black Sea coastline against the accelerating impacts of climate change and natural degradation. Facing severe coastal retreat that threatens to wash away vital land, Romania is currently executing one of the most extensive coastal defense projects in Europe. The strategy employs a hybrid approach of "hard" and "soft" engineering: it involves the installation of extensive submerged and emerged breakwaters to dissipate wave energy, alongside massive beach nourishment campaigns that deposit millions of cubic meters of sand to artificially widen the shore. Crucially, the project goes beyond mere physical defense by integrating ecological restoration, including the deployment of artificial reefs to revive local marine biodiversity and stabilize the nearshore marine transition zone (Dinu, 2025).

For Romania's blue economy, this Master Plan acts as an existential defense mechanism, particularly for the coastal tourism and maritime real estate sectors. The continuous erosion of the shoreline poses a direct financial threat to major seaside resorts—such as Mamaia, Eforie, and Mangalia—that rely entirely on wide, stable beaches to attract visitors and sustain local businesses. By artificially expanding the coastal buffer zone, the strategy not only shields high-value infrastructure from violent storm surges and sea-level rise but also secures the foundational asset of the maritime tourism industry. Ultimately, halting the physical collapse of the shoreline ensures that Romania's coastal economy remains resilient, biologically sound, and economically viable for decades to come.

Multiannual National Strategic Plan for Aquaculture (2021–2030)

The Multiannual National Strategic Plan for Aquaculture (2021–2030), heavily supported by the EU's Aquaculture and Fisheries Program (PAP) and the European Maritime, Fisheries and Aquaculture Fund (EMFAF), marks a pivotal shift in how Romania manages its aquatic food systems. Aligned with the European Green Deal, the Biodiversity Strategy, and the "Farm to Fork" initiative, the plan aims to move the sector away from highly extractive, high-impact farming toward sustainable, climate-resilient practices. The strategy provides substantial financial incentives for aquaculture farms that adopt organic production methods, utilize Recirculating Aquaculture Systems (RAS) to minimize water consumption and effluent discharge, and integrate renewable energy sources like solar panels to reduce their carbon footprint. Furthermore, it strongly advocates for integrated multi-trophic aquaculture—such as traditional cyprinid polyculture in the Danube Delta—which naturally recycles nutrients and provides critical ecosystem services like water purification and carbon sequestration.

For Romania's blue economy, this strategic transition is essential for harmonizing commercial food production with stringent environmental conservation. Historically, intensive inland and coastal fish farming contributed to the nutrient loading of the Danube and Black Sea, exacerbating eutrophication and ecological degradation. By strictly regulating these environmental footprints

and heavily subsidizing eco-friendly modernization, the plan ensures that aquaculture enhances, rather than degrades, the foundational water quality of the macrosystem. Beyond ecological benefits, the strategy diversifies the rural maritime economy by encouraging fish farms to incorporate complementary "blue" activities—such as eco-tourism, educational programs, and recreational fishing. Ultimately, the plan seeks to increase national food security and local profitability while firmly establishing a low-emission, highly circular aquaculture sector as a cornerstone of Romania's modern blue economy.

General Master Plan for Transport (Naval and Maritime Focus)

The General Master Plan for Transport (naval and maritime focus) serves as Romania's definitive blueprint for modernizing its extensive maritime and inland waterway infrastructure. While fundamentally a logistical and engineering strategy, the Master Plan has profound implications for the blue economy by governing the development of the Port of Constanța—the largest commercial hub on the Black Sea—and the critical inland shipping arteries of the Danube River. A central priority of the plan is the transition toward "green shipping" and intermodal transport. To achieve this, the strategy directs substantial investments into modernizing port facilities, expanding shore-side electricity to reduce docked vessel emissions, and installing advanced waste reception facilities to prevent marine dumping. Furthermore, it mandates crucial dredging operations and the deployment of specialized technical vessels to maintain the navigability of the Danube, deliberately shifting heavy freight traffic away from high-emission roadways and onto these highly efficient, low-emission waterways.

For Romania's blue economy, this Master Plan is the essential framework for harmonizing massive industrial logistics with strict environmental preservation. Historically, dense commercial shipping traffic and outdated port operations have contributed heavily to the carbon footprint and localized water pollution of the Black Sea coast and the Danube Delta. By aggressively funding the decarbonization of its maritime transport sector, Romania ensures that the economic engine of its commercial shipping does not degrade the water quality required for other vital blue sectors, such as coastal tourism and commercial aquaculture. Moreover, by transforming Constanța and the river ports into highly efficient, sustainable, and interconnected hubs, the strategy secures Romania's long-term competitive advantage as a premier, eco-conscious maritime gateway bridging Western Europe and the broader Black Sea region.

Integrated Strategy for the Sustainable Development of the Danube Delta (ISDDD 2030)

Adopted in 2016 and extending to 2030, this strategy operates through a unique financial tool called the Integrated Territorial Investment (ITI) Danube Delta mechanism. Designed with expertise from the World Bank, it serves as the definitive blueprint for harmonizing human habitation and economic growth with the strict environmental protections required in a UNESCO Biosphere Reserve. The ITI mechanism allows the region to pool funding from multiple European structural and investment funds—including the European Maritime and Fisheries Fund (EMFF)—into a single, coordinated territorial strategy rather than relying on fragmented sectoral grants.

For the blue economy, ISDDD 2030 represents a critical shift from extractive resource exploitation to sustainable valorization. The strategy explicitly targets the modernization of the local maritime sectors that define the Delta: sustainable inland fisheries, eco-friendly aquaculture, and high-value nature tourism. By directing massive investments toward improving municipal water infrastructure, greening local boat transport networks, and financially supporting small-scale fishing communities, the strategy ensures that the local economy thrives without degrading the

fragile aquatic ecosystem. It effectively transforms the Danube Delta into a living laboratory for the blue economy.

Smart Specialization Strategy (RIS3) for the South-East Region

As part of the EU's cohesion policy, Romania's development regions are required to implement Research and Innovation Strategies for Smart Specialization (RIS3). For the South-East Region—which encompasses the coastal counties of Constanța and Tulcea—Blue Growth is designated as a foundational pillar of regional specialization. This strategy deliberately links academic institutions, marine research centers, and private enterprise to foster technological advancements specifically within maritime and aquatic sectors.

Within the blue economy, RIS3 acts as the primary catalyst for "blue innovation." It channels regional funding into high-tech maritime applications, such as marine biotechnology, the digitization of port logistics, and the development of eco-efficient shipbuilding technologies at the major commercial shipyards in Constanța, Mangalia, and Tulcea. Furthermore, it supports the transition of coastal tourism from a volume-based, seasonal model to a high-value, year-round industry integrated with natural heritage. By financially backing research and technological transfer, this strategy ensures that Romania's blue economy evolves into a modern, knowledge-based, and highly competitive European sector.

National Strategy on Climate Change and Low Carbon Economic Growth

While primarily a broad national framework for decarbonization and climate adaptation, this strategy includes targeted sectoral action plans that heavily impact Romania's coastal and marine zones. It explicitly recognizes the vulnerability of the Black Sea and the Danube River basin to climate-induced stressors, such as rising sea levels, severe droughts affecting river navigability, and increasing water temperatures that threaten marine biodiversity.

For the blue economy, this strategy enforces adaptation measures that are critical for long-term sector survival. It mandates climate-proofing for new maritime infrastructure, ensuring that port expansions and coastal tourism developments can withstand extreme weather and storm surges. Additionally, it drives the decarbonization of traditional blue sectors by promoting offshore renewable energy—laying the regulatory groundwork for future Black Sea wind farms—and incentivizing emission reductions in maritime transport. By legally intertwining climate resilience with economic planning, the strategy ensures that Romania's blue economy actively transitions toward a resilient, low-carbon future.

Alignment with the Common Maritime Agenda for the Black Sea

The Common Maritime Agenda (CMA) for the Black Sea, endorsed in 2019, serves as the defining regional framework for maritime cooperation among Black Sea nations. It establishes three overarching goals—protecting ecosystems, driving sustainable economic growth, and mobilizing investment—broken down into specific regional priorities.

Romania's national strategies act as the critical domestic levers that translate these broad regional ambitions into binding regulations and targeted funding. Here is how Romania's strategic frameworks directly correlate with the three primary goals of the CMA:

Healthy Marine and Coastal Ecosystems

CMA Priorities: Address marine pollution and plastic litter, support sustainable fisheries, and preserve biodiversity.

- **Combating marine litter:** Romania's ROCES 2030 (Circular Economy Strategy) directly targets the CMA priority of reducing marine plastic pollution at its source. By mandating better municipal wastewater treatment and reducing single-use plastics, Romania cuts off the land-based pollution that flows via the Danube into the Black Sea.
- **Sustainable fisheries:** The Multiannual National Strategic Plan for Aquaculture operationalizes the CMA's call for sustainable food systems. By subsidizing the transition away from intensive farming to eco-friendly, low-emission operations (like Recirculating Aquaculture Systems), Romania ensures its fishing sector aligns with regional environmental limits.
- **Habitat restoration:** The Danube-Black Sea Lighthouse (under Mission 2030) and the Master Plan for Coastal Erosion serve the CMA's biodiversity targets. They implement the physical engineering and nature-based solutions required to stabilize the coastline and revive degraded aquatic habitats.
- **Integrated marine governance and conservation:** Romania's Marine Strategy Framework (updated by Government Decision 432/2020) and its Maritime Spatial Plan (approved via GO 97/2023) directly fulfill the CMA's priority of preserving marine biodiversity. The Marine Strategy legally enforces a strict "Program of Measures" designed to achieve and maintain Good Environmental Status (GES) in the Black Sea. Simultaneously, the Maritime Spatial Plan maps and legally protects marine protected areas (MPAs), ensuring that emerging blue economy sectors—such as offshore wind development and maritime transport—do not expand into or pollute ecologically vulnerable zones.
- **Strategic alignment with "Life Below Water":** Romania's overarching National Sustainable Development Strategy 2030 (SNDD 2030) codifies UN SDG 14 directly into domestic policy, acting as a high-level safeguard for the CMA's environmental objectives. It mandates that all expanding maritime sectors—from coastal real estate to port logistics—must actively mitigate their footprints, ensuring that Romania's pursuit of "blue growth" never compromises the baseline ecological health of the Black Sea and the Danube River basin.

A Competitive, Innovative, and Sustainable Blue Economy

CMA Priorities: Foster innovative business models, stimulate research, and promote transport and digital connectivity.

- **Blue innovation and high-tech specialization:** The Smart Specialization Strategy (RIS3) for the South-East Region directly addresses the CMA priority to stimulate research and new business models. By funneling regional structural funds into marine biotechnology, green shipbuilding, and the digitization of port logistics in Constanța and Tulcea, the strategy transitions the local blue economy from traditional labor-intensive models to a modern, knowledge-based industry.
- **Green connectivity and transport:** The General Master Plan for Transport perfectly aligns with the CMA's goal of enhancing maritime connectivity and reducing transport emissions. By directing investments toward shore-side electricity at the Port of Constanța and prioritizing the dredging of the Danube River to shift freight from high-emission roads to inland waterways, Romania is actively decarbonizing its maritime logistics network.

- **Sustainable growth:** Romania's Maritime Spatial Planning (MSP) guarantees that the expansion of competitive sectors (like offshore wind and shipping) does not cannibalize other blue sectors or violate environmental boundaries, achieving the CMA's vision of balanced growth.
- **Offshore wind energy expansion:** In May 2024, Romania adopted Law No. 121/2024 on Offshore Wind Energy, a landmark framework designed to decarbonize the national energy grid and create a massive new blue economy sector. Directly fulfilling the CMA's call for clean, marine-based energy, this law establishes the legal perimeter for constructing wind farms in the Black Sea. It mandates strict environmental impact assessments to ensure turbines do not harm marine biodiversity, while explicitly aiming to integrate the first megawatts of offshore wind into the National Energy System by 2032.
- **Sustainable "blue" tourism:** Addressing the CMA priority of fostering eco-friendly coastal business models, Romania is shifting focus away from volume-heavy summer resort tourism. Under the broader National Tourism Strategy, there is a targeted push toward integrating the Black Sea coast with the Danube Delta through specialized ecotourism. This includes establishing protected green corridors, enforcing carrying-capacity limits on sensitive beaches, and promoting year-round cultural, culinary, and nature-based tourism to alleviate peak-season strain on coastal infrastructure.

Fostering Investment in the Black Sea Blue Economy

CMA Priorities: Promote maritime entrepreneurship and improve access to financial resources.

- **Targeted regional funding mechanisms:** The Integrated Strategy for the Sustainable Development of the Danube Delta (ISDDD 2030) is Romania's strongest financial tool for achieving this CMA goal. By utilizing the Integrated Territorial Investment (ITI) mechanism, Romania pools fragmented European structural funds into a single, cohesive regional pipeline. This directly improves "access to financial resources" for local fishermen, eco-tourism operators, and maritime SMEs.
- **National Recovery and Resilience Plan (PNRR):** Following the pandemic, Romania incorporated blue economy priorities directly into its NRRP to unlock billions in EU funding. Component 2 of the plan heavily targets water management, earmarking massive investments for the modernization of wastewater networks and the ecological restoration of river basins. By treating water infrastructure as an economic asset, the NRRP secures the financial backing necessary to execute the environmental mandates required for maritime industries to thrive.
- **Bankable projects:** By aligning its national targets with the CMA, Romania ensures its domestic projects are eligible for major EU funding streams, such as the European Maritime, Fisheries and Aquaculture Fund (EMFAF). This strategic alignment transforms high-level environmental regulations into bankable, profitable investments that attract private sector capital to the Black Sea coast.

Regional and local strategies

While overarching national legislation and European directives provide the foundational architecture for Romania's blue economy, the actual operationalization of these principles occurs at the regional and local levels. The practical implementation of marine and coastal policies must navigate the complex realities of local economic demands, community livelihoods, and site-specific environmental vulnerabilities. To manage this effectively, Romania's 245-kilometer coastal strip is administratively and ecologically divided into two highly distinct management

zones. Each sector utilizes tailored regional frameworks and spatial planning instruments to balance economic exploitation with ecosystem preservation.

The Northern sector (the Danube Delta Biosphere Reserve)

The Northern coastal sector is defined by the Danube Delta, a vast, dynamic transition zone where freshwater river systems merge with the open marine environment of the Black Sea. Recognizing its immense global ecological value, this area is governed by specialized conservation legislation, primarily Law no. 82/1993 on the establishment of the Danube Delta Biosphere Reserve. Under this legal framework, the entire region is managed by the Danube Delta Biosphere Reserve Authority (DDBRA), which acts as the supreme administrative body enforcing strict, ecosystem-based management protocols. The DDBRA's mandate is to ensure that all economic activities are strictly subordinated to the preservation of the Delta's fragile wetland and marine habitats. Large-scale industrial developments, mass tourism complexes, and high-impact maritime operations are legally prohibited or heavily restricted within the reserve's boundaries.

Consequently, the local blue economy strategy for the Northern sector revolves around high-value, low-impact sustainability. Regional policies heavily prioritize the development of ecotourism over traditional mass tourism, enforcing carrying-capacity limits to prevent the degradation of pristine habitats. Furthermore, the local strategy stringently regulates resource extraction, particularly through the imposition of strict, science-based catch quotas and seasonal bans on traditional artisanal fisheries to allow sturgeon and other endemic fish stocks to recover. To fund this transition from extractive to sustainable economic models, the region leverages specialized financial instruments like the Integrated Territorial Investment (ITI) Danube Delta mechanism. This allows local authorities to channel European structural funds directly into modernizing small-scale fishing fleets, developing green inland transport, and supporting local communities in transitioning to sustainable aquaculture and nature-based tourism.

The Southern sector (the industrialized and urbanized littoral)

In stark contrast to the protected Northern sector, the Southern coastal strip—stretching from the industrial hub of Cape Midia down to the Bulgarian border at Vama Veche—is the engine of Romania's commercial blue economy. Characterized by dense urbanization, intense commercial shipping, and expansive tourism infrastructure, this area requires a highly complex regulatory approach to mitigate severe environmental stressors. The primary legal framework governing this sector is Emergency Ordinance (OUG) no. 202/2002 on Integrated Coastal Zone Management (ICZM). This ordinance mandates the coordinated administration of the coastal zone, requiring local authorities across Constanța County to collaboratively manage the intense spatial conflicts between economic growth and environmental protection.

Local strategies within the Southern sector focus intensely on three primary management objectives. First, authorities are tasked with balancing urban growth with environmental protection. This involves enforcing strict zoning regulations to prevent the unchecked expansion of mass tourism real estate—particularly in vulnerable resorts like Mamaia and Eforie—from destroying the remaining natural coastal buffer zones and dune ecosystems. Second, there is a critical focus on mitigating Land-Sea Interactions (LSI). Given the heavy industrialization of the area, local strategies mandate the continuous modernization of municipal wastewater treatment plants and strictly regulate industrial effluents from the Port of Constanța and the Midia petrochemical platforms. This is essential to prevent nutrient runoff and chemical discharges from causing eutrophication in the nearby coastal waters, which would devastate the very tourism industry the region relies upon.

Finally, the Southern sector strategy necessitates the seamless coordination of marine and terrestrial planning. Local municipal urban development plans (PUG) must be integrated directly

with national spatial frameworks, specifically the newly adopted Maritime Spatial Plan (Government Ordinance no. 97/2023) and the Offshore Wind Energy Law (Law no. 121/2024). As Romania begins to develop offshore wind farms and expand its commercial shipping lanes, terrestrial infrastructure—such as port grid connections and logistics hubs—must be locally zoned to support these offshore sectors without cannibalizing the space required for coastal tourism and local fisheries.

Beyond simply applying national frameworks, local and county-level administrations in the South act as the primary implementers of climate adaptation strategies, such as the ongoing multi-million-euro coastal erosion protection projects. By utilizing ecosystem-based management approaches, these regional strategies ensure that the intense economic productivity of the Southern littoral does not irreversibly degrade the natural marine capital that sustains it.

Alignment and coherence (consistency between EU, national, and regional levels)

The successful governance of the blue economy in Romania relies heavily on the principle of coherence—ensuring that high-level European Union directives are accurately translated into national legislation and effectively executed by regional and local authorities. Because maritime spaces are dynamic and interconnected, fragmented policymaking can lead to spatial conflicts, environmental degradation, and the loss of EU funding. In Romania, this alignment process is complex, involving the synchronization of broad sea-basin strategies with targeted domestic action plans and municipal zoning regulations. While the strategic framework is generally well-aligned with European priorities, the actual cohesion between governance levels remains a continuous administrative challenge.

The foundational mechanism for policy alignment is the direct transposition of EU directives into Romanian law. A primary example is the EU Maritime Spatial Planning (MSP) Directive (2014/89/EU), which mandates that member states organize human activities in marine areas to meet ecological, economic, and social objectives. Romania transposed this directive through Law no. 88/2017 (approving Government Ordinance no. 18/2016). After years of development and cross-border projects (such as the MARSPLAN BS initiatives), Romania officially adopted its comprehensive Maritime Spatial Plan in November 2023 via Government Ordinance no. 97/2023. This legal alignment is crucial because it ensures that national offshore zoning—such as designating areas for the new offshore wind sector or expanding shipping lanes—strictly adheres to European environmental impact standards and does not encroach upon EU-designated Natura 2000 protected areas.

Beyond strict legal compliance, Romania aligns its economic strategies with overarching sea-basin initiatives, most notably the Common Maritime Agenda (CMA) for the Black Sea (endorsed in 2019). The CMA acts as a political compass, setting three regional goals: healthy ecosystems, a competitive blue economy, and fostered investments. Romania's domestic policies are deliberately drafted to operationalize these goals. For instance, the national Circular Economy Strategy (ROCES 2030) aligns directly with the CMA's priority to reduce marine litter, while the Multiannual National Strategic Plan for Aquaculture subsidizes the eco-friendly practices demanded by the CMA's call for sustainable food systems. By maintaining this strategic cohesion, Romania ensures that its domestic projects remain eligible for EU funding instruments, such as the European Maritime, Fisheries and Aquaculture Fund (EMFAF).

Coherence is also required in how maritime innovation is funded and developed. Romania participates in the Sustainable Blue Economy Partnership, a Horizon Europe co-funded initiative involving 74 partners across 30 countries. By anchoring its national maritime research initiatives within this partnership's Strategic Research and Innovation Agenda, Romania ensures that its local scientific efforts—ranging from marine biotechnology in Constanța to ecological monitoring

in the Danube Delta—are aligned with pan-European goals. This prevents the duplication of research efforts and leverages pooled European funding to transition local maritime sectors toward climate neutrality.

Despite strong legislative and strategic alignment on paper, researchers and policy analysts frequently note discrepancies during local implementation. A primary hurdle is institutional fragmentation: maritime responsibilities in Romania are divided among multiple ministries (Environment, Transport, Development, Agriculture), which can complicate local execution. Recent academic reviews highlight that while the national programmatic documents accurately reflect European policies like the Green Deal, effective implementation is often hindered by limited administrative capacity at the municipal and regional levels. Achieving true coherence requires not just legal transposition, but continuous capacity-building and inter-institutional coordination to ensure local administrations can successfully execute complex, multi-sectoral blue economy projects (Savu, 2026).

Target group mapping and sector analysis

As the regulatory architectures, marine spatial plans, and regional governance frameworks establish the rules for Romania's maritime spaces, successfully achieving a sustainable blue economy ultimately depends on the actors and industries operating within it. Transitioning from policy to practice requires a granular understanding of the complex network of stakeholders—spanning government bodies, private industry, academia, and civil society—whose daily activities impact the Black Sea and the Danube Delta. Target group mapping serves as the critical first step in this process, systematically identifying the key players driving economic value, as well as those most vulnerable to environmental degradation and regulatory shifts. By isolating these groups, policymakers and investors can tailor capacity-building initiatives, direct funding toward precise innovation gaps, and foster the multi-actor collaborations necessary to transition away from extractive practices.

Building upon this stakeholder foundation, a comprehensive sector analysis is essential to diagnose the current health and future potential of Romania's maritime industries. The national blue economy encompasses a diverse portfolio of established sectors—such as commercial fisheries, extensive aquaculture, coastal tourism, and intense maritime transport centered around the Port of Constanța—alongside emerging industries like offshore wind energy and marine biotechnology. Analyzing these sectors reveals shared structural challenges, including the pressing need for digitalization, adaptation to climate-induced stressors like coastal erosion, and the financial hurdles of decarbonizing fleets and facilities. By mapping the target groups against these sectoral realities, this chapter provides the actionable insights required to deploy European funding mechanisms effectively and ensure that economic growth remains inextricably linked to the ecological restoration of Romania's aquatic resources.

In 2025, Romania's Gross Domestic Product (GDP) increased by 0.7% in real terms compared to the previous year, reaching approximately 1,916.4 billion lei (roughly €385 billion). For 2026, economic forecasts project a more moderate real GDP growth of between 0.1% and 0.5% amid ongoing fiscal consolidation and inflation challenges. Within this constrained macroeconomic landscape, the national blue economy serves as an increasingly vital strategic pillar, even if its direct statistical footprint appears modest. Currently, the established blue economy sectors in Romania directly employ over 65,000 people and generate approximately €1.5 billion in Gross Value Added (GVA), accounting for roughly 0.6% of the national GDP. While this represents a relatively small overall share compared to other coastal European nations, the maritime sector

exerts a massive indirect multiplier effect on the broader economy, with maritime logistics alone facilitating the majority of Romania's foreign trade.

The structural composition of Romania's blue economy is heavily anchored by intense industrial and logistical activity, with port operations—primarily driven by the massive multipurpose Port of Constanța—accounting for the largest share of the sector's economic value. This is closely followed by the shipbuilding and repair industry, living resources (fisheries and aquaculture), and coastal tourism along the Black Sea. However, these traditional sectors are currently navigating a complex transition. While port infrastructure is seeing aggressive investment and volume growth driven by regional geopolitical shifts and nearshoring trends, other areas like legacy shipbuilding have faced employment contractions. Consequently, precisely mapping the stakeholders and analyzing the specific dynamics of these sectors is crucial for understanding how Romania can leverage its maritime assets to stimulate broader economic recovery while meeting stringent European sustainability targets.

Figure 1 reveals that the blue economy is heavily anchored by industrial and primary production sectors. Shipbuilding and repair represent the single largest contributor, accounting for 32.4% of the total GVA, closely followed by living resources (fisheries and aquaculture) at 27.2%. Together, these two sectors generate nearly 60% of the blue economy's direct economic value, underscoring the critical importance of marine manufacturing and biological resource management.

The remaining portion of the chart reflects the significant role of maritime logistics and leisure industries. Services and infrastructure related to port activities comprise 17.4% of the GVA, while coastal tourism holds a comparable share at 16.7%. Interestingly, maritime transport accounts for a surprisingly modest 4.4% of direct GVA, with the remaining small fraction (approximately 1.9%) allocated to emerging or minor sectors. This distribution demonstrates a diversified blue economy where heavy marine industry and primary food production outpace logistics and tourism in terms of direct value generation, providing a vital baseline for regional development and investment targeting.

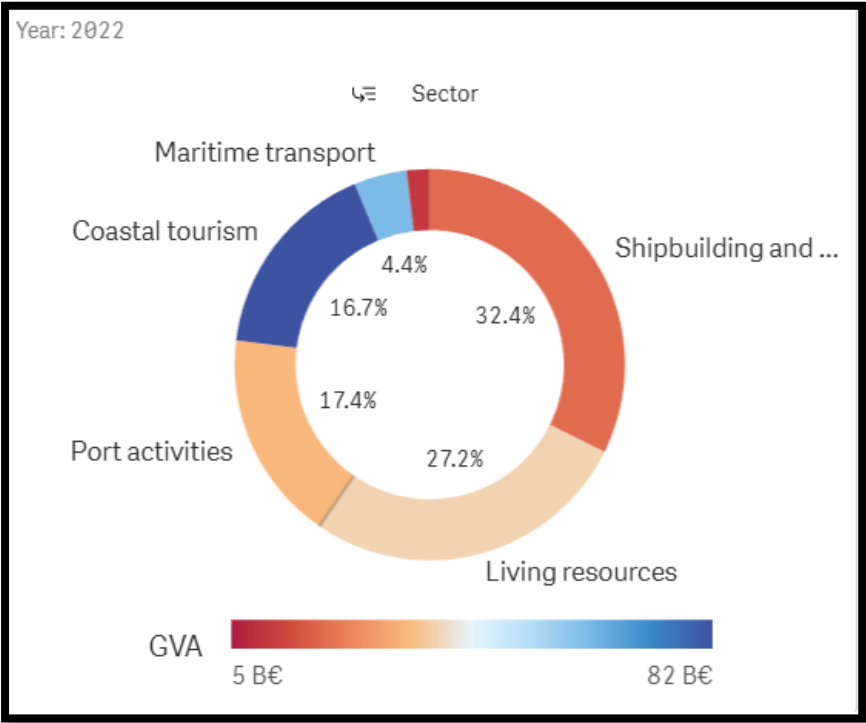


Figure 1- Romania — Blue Economy GVA by Established Sector (2022). Source: EU Blue Economy Observatory (EUBO)

	2020	2021	2022
RO	0,87%	0,91%	0,84%

Figure 2 - Romania – Blue economy (%) of national jobs by Established Sector (2022). Source: EU Blue Economy Observatory (EUBO)

Figure 2 illustrates the fluctuating, yet consistently modest, proportional weight of the blue economy within Romania's broader national framework over a three-year period. In 2020, the sector accounted for 0.87% (likely representing its share of national GVA or employment), which saw a slight increase to a peak of 0.91% in 2021. However, this upward trajectory did not sustain into 2022, as the share contracted to 0.84%.

This minor volatility highlights a sector that, while functionally critical to the nation's logistics and trade, struggles to significantly expand its direct statistical footprint relative to the rapid growth of Romania's wider onshore economy. The dip in 2022 suggests that traditional blue sectors may be facing structural or macroeconomic headwinds, reinforcing the need for targeted investments and innovation to stabilize and grow the maritime economy's share in the future.

Sector analysis

Ports, related facilities and logistics networks

Romania's strategic location on the Black Sea provides a key advantage for trade and transport in the region. The Port of Constanța, the largest maritime port in Romania and the entire Black Sea, plays a crucial role in supplying Central and Eastern Europe, handling roughly 88 million tonnes of cargo and 1 million TEUs in 2025. It serves as a major hub for container traffic, bulk goods, and general cargo, and includes a modern passenger terminal.

In recent years, the port has undergone significant expansion and modernization, featuring new terminals and facilities to manage growing regional trade flows. Thanks to its strategic position and these continuous infrastructure investments, the Port of Constanța serves as a vital gateway for trade between Europe and Asia, connecting Romania to major international shipping routes. To facilitate the efficient handling of diverse cargo streams, the Port of Constanța operates a comprehensive and highly specialized infrastructure network. This operational capacity is divided across four primary sectors:

- **Container terminals:** Functioning as the cornerstone of the port's role as a premier Black Sea transshipment hub, these facilities are outfitted with advanced handling equipment and modern gantry cranes to ensure the rapid turnaround of containerized freight.
- **Bulk cargo terminals:** Engineered for high-volume operations, these terminals feature dedicated loading and unloading infrastructure specifically designed for the rapid transit of agricultural grains, heavy ores, and fertilizers.
- **General cargo terminals:** Providing essential operational flexibility, these zones are designed to manage non-standard freight, seamlessly accommodating breakbulk, specialized project cargo, and roll-on/roll-off (Ro-Ro) logistics.

- **Passenger terminal:** Serving the maritime tourism and transit sector, this modernized facility is fully equipped with advanced amenities to process passengers and luggage for both international cruise ships and regional ferries.

The Constanța South Container Terminal operates as a Free Zone, offering benefits such as tax exemptions and simplified customs procedures, which encourage investments and boost trade through the port.

The port has excellent connections with the hinterland, being integrated into an extensive network of roads and railways. This ensures efficient transport of goods to and from the port, facilitating access to major industrial centers in Romania and beyond.

Investments in modernization and expansion of operational capacities, along with adaptations to economic and political trends, have led to the continuous growth of cargo volumes transiting the port.

In 2024 and 2025, cargo traffic underwent a recalibration, normalizing to approximately 58 million tons and 52.2 million tons, respectively. This represented a decrease from the historic peak of 92.69 million tons recorded in 2023, largely driven by the stabilization of regional trade routes and shifting logistics networks following the initial supply chain shocks of the war in Ukraine. Despite this recent moderation in overall tonnage, the Port of Constanța entered Europe's top 10 seaports by cargo volume in 2024, confirming its long-term structural importance and elevated operational capacity compared to pre-2020 levels.

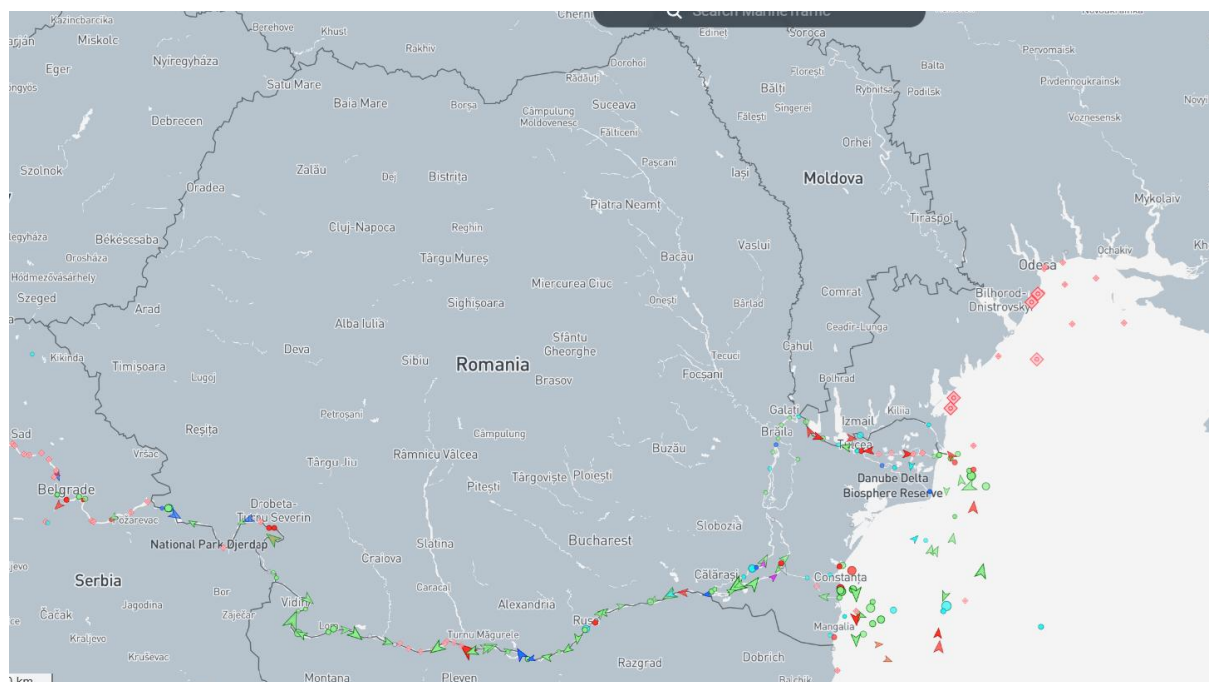


Figure 3 - Marine traffic (Source:

<https://www.marinetraffic.com/en/ais/home/centerx:28.1/centery:45.9/zoom:7>

Another significant transport connection for Romania is its membership in TRACECA.

TRACECA (Transport Corridor Europe-Caucasus-Asia) is an internationally recognized program aimed at strengthening economic relations, trade, and transport communications between the Black Sea region, the South Caucasus, and Central Asia. It is built on sustained political will and common aspirations among all member states.

In September 1998, during the historic Baku Summit, 12 TRACECA member countries signed the “Multilateral Basic Agreement on International Transport for the Development of the Europe-

Caucasus-Asia Corridor" (MLA). This agreement was designed to fully exploit the geopolitical and economic potential of the region. In 2009, the Islamic Republic of Iran joined TRACECA. The TRACECA corridor plays an essential role in the gradual development of trade and economic trends in the transport sector, ensuring efficient and reliable Euro-Asian transport links to promote the regional economy. The major traffic flows transiting this corridor originate from both Western and Central Europe, as well as from Central and Southeast Asia. At present, the TRACECA network includes the transport system of the 14 member states of the "Multilateral Basic Agreement on International Transport for the Development of the Europe-Caucasus-Asia Corridor" (MLA TRACECA)(figure 4): Azerbaijan, Armenia, Georgia, Iran, Kazakhstan, Kyrgyzstan, Moldova, Romania, Tajikistan, Turkmenistan, Uzbekistan, Ukraine, and Türkiye. (<https://traceca-org.org/en/countries/>)

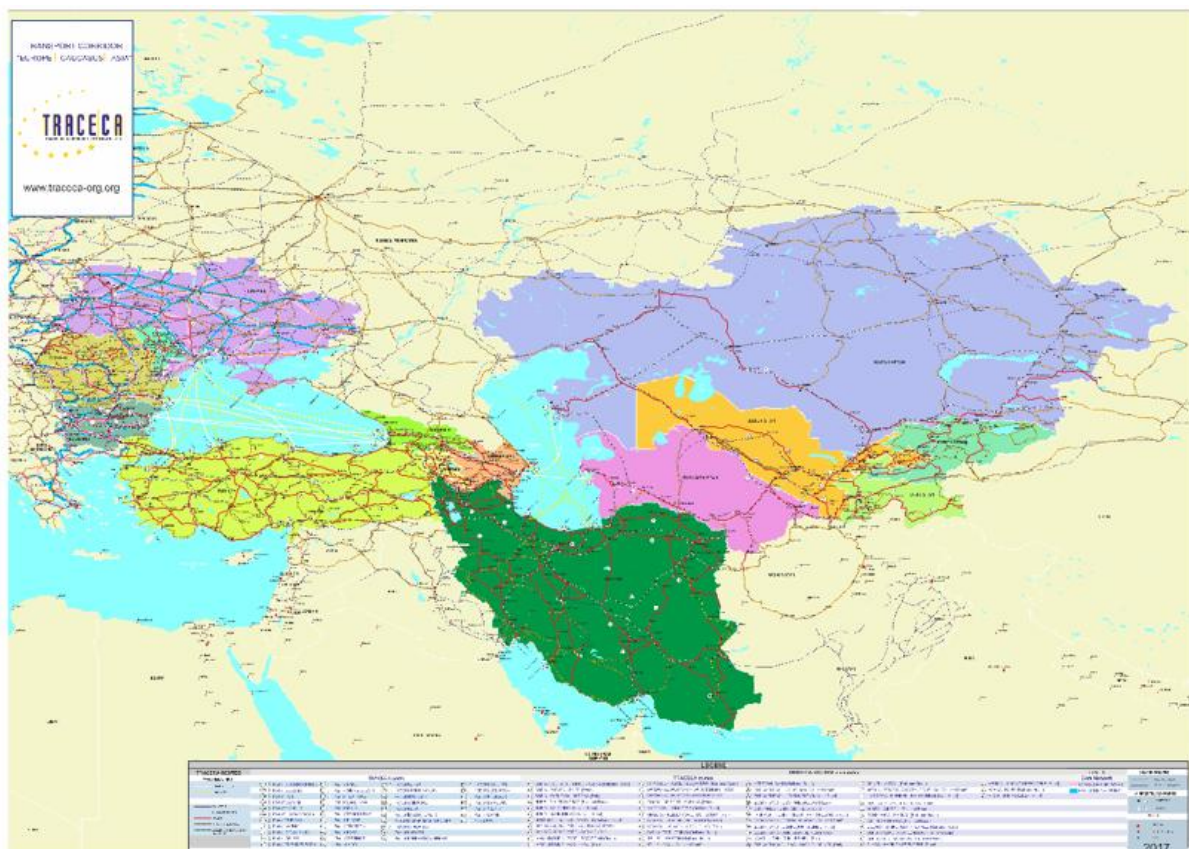


Figure 4 – TRACECA network (Source: <https://traceca-org.org/en/countries/>)

Shipbuilding industry

Romania's shipping industry is fundamentally anchored by its geostrategic location on the western coast of the Black Sea and its control over the maritime terminus of the Danube River. The Port of Constanța serves as the critical node in this ecosystem, acting as the largest maritime port in the Black Sea basin and a premier transshipment hub for goods moving between Europe, Central Asia, and the Far East. Within the context of a modern blue economy, the sector has evolved significantly beyond traditional cargo handling. It increasingly integrates highly complex multimodal logistics, seamlessly connecting deep-sea maritime shipping with the European inland waterway network via the Danube-Black Sea Canal. This unique dual connectivity positions Romania as a primary, indispensable gateway for the European Union's eastern trade corridors, particularly in the high-volume transit of agricultural bulk, energy resources, and containerized freight.

A defining characteristic of Romania's maritime footprint is the outsized economic and ecological role of its river shipping industry. The Danube River provides a highly cost-effective and environmentally favorable transport corridor, aligning perfectly with the European Green Deal's mandate to shift heavy cargo away from congested, high-emission road networks. Romanian river transport operators manage significant fleets of barges and pushers, facilitating the movement of bulk commodities—such as grain, ores, and construction materials—deep into Central Europe. Enhancing the navigability, safety, and sustainability of this inland network is a core priority of Romania's blue economy strategy. This requires continuous, capital-intensive investments in ecological dredging, modernized river port infrastructure, and the digitalization of waterway traffic management (River Information Services) to ensure resilient, year-round operability while minimizing disruption to riverine ecosystems.

While Romania's domestically flagged commercial maritime fleet experienced a significant decline following privatization in the late 20th century, its shipbuilding and marine engineering sectors remain robust, internationally competitive pillars of the national Blue Economy. Shipyards located in Constanța, Mangalia, Tulcea, and Brăila are deeply integrated into global maritime supply chains. Rather than competing in the low-cost bulk carrier market, these facilities have successfully pivoted toward high-value, specialized construction. Romanian yards are now highly regarded for assembling offshore support vessels, eco-friendly ferries, and technologically advanced hulls for prominent European maritime operators. Furthermore, as the Black Sea region actively explores offshore renewable energy, these shipyards are strategically positioning themselves to provide the necessary construction, maintenance, and retrofitting services for offshore wind infrastructure, effectively linking traditional maritime manufacturing with emerging blue energy sectors.

The contemporary landscape of the Romanian shipping industry is heavily dictated by the complex geopolitical realities of the Black Sea region. The ongoing disruption of traditional northern maritime routes has forced a rapid, structural reconfiguration of regional supply chains, elevating Romania's status as a critical guarantor of regional trade continuity. The national shipping sector has absorbed unprecedented volumes of transit cargo, particularly agricultural exports from neighboring states. This surge necessitated emergency infrastructure expansions, the streamlining of customs processing, and the rapid enhancement of rail-to-ship connectivity within port zones. This intense geopolitical pressure has ultimately acted as a catalyst for modernization, compelling the industry to eliminate operational bottlenecks and build long-term resilience against external macro-economic shocks—a fundamental tenet of a sustainable Blue Economy.

In strict alignment with the European Union's sustainable Blue Economy mandates, the Romanian shipping sector is actively navigating the technological and financial complexities of maritime decarbonization. The industry faces mounting regulatory pressure to dramatically reduce its environmental footprint, prompting strategic investments in green port infrastructure. Current initiatives focus on the gradual implementation of shore-side electricity (cold ironing) to eliminate at-berth emissions, the modernization of port reception facilities for ship-generated waste, and the establishment of bunkering infrastructure for alternative marine fuels such as LNG, and eventually, methanol and green hydrogen. Transitioning the country's aging inland and coastal fleets to low-emission propulsion systems remains a significant financial challenge; however, securing blue finance for this transition represents the most critical step in transforming Romania's maritime transport network into a climate-neutral engine of the regional economy.

Strategically located on the western coast of the Black Sea in Constanța, Romania, Constanța Shipyard S.A. (SNC) operates as one of the largest, most comprehensive shipbuilding, repair, and conversion facilities in Europe. Globally recognized as a premier constructor of medium-range oil and chemical tankers, the shipyard is fully integrated into the international maritime

supply chain. Its unique multimodal accessibility—reachable by deep-sea draft via the Bosphorus Strait and by inland waterway through the Danube-Black Sea Canal—positions it as a critical logistics hub. Operating as the only facility in the Black Sea basin capable of docking Suezmax and Capesize vessels, SNC features infrastructure equipped to handle maritime vessels up to 200,000 DWT. As of 2026, the shipyard maintains an operational cadence of 80 to 100 complex repair and conversion projects annually, playing a vital role in the region's Blue Economy by extending vessel lifecycles and modernizing fleets to meet contemporary environmental standards.

Anchoring the regional economy as the largest employer in Tulcea County with a workforce exceeding 2,700 personnel, Vard Tulcea Shipyard stands as the financial and operational leader of Romania's shipbuilding industry. The facility firmly established this dominance in 2022, generating over 1.21 billion RON in revenue and an industry-leading 64.1 million RON in net profit—vastly outpacing regional competitors such as Constanța Shipyard (317.1 million RON revenue) and Damen Shipyards Mangalia (which reported significant losses). As of 2026, Vard Tulcea has successfully translated this financial resilience into a leading position within the European Blue Economy. Operating in high-tech synergy with its Norwegian parent group, the Tulcea shipyard has shifted its primary focus away from traditional bulk carriers, specializing instead in the hull construction of highly complex, eco-friendly tonnage designed specifically to service the offshore renewable energy sector. Data from the EU Blue Economy Observatory indicates that while the maritime economy accounts for roughly 0.8% of national employment and 0.6% of national GDP, its regional impact on the Dobrogea coastal zone is foundational.

Port activities represent the largest economic engine of Romania's Blue Economy, generating 27% of its total GVA. The Port of Constanța serves as the primary eastern maritime gateway for the European Union, handling over 67 million tonnes of cargo annually. This sub-sector functions as a vital logistical hub linking Central and Eastern Europe with Middle Eastern and Asian trade corridors. Economic performance here is driven by substantial private and public investments in deep-water berths, automated grain terminals, and intermodal rail connections designed to maximize container through-traffic. Historically a pillar of coastal employment, shipbuilding and repair contributes 23% of Romania's Blue Economy GVA and accounts for 26% of its maritime workforce. Romania maintains some of the largest active shipyards in the Black Sea basin, notably at Constanța, Mangalia, and Tulcea. However, this sector has undergone significant structural contraction, experiencing an employment drop of roughly 36% over the past decade. This decline reflects an ongoing transition away from low-cost, labor-intensive steel hull welding toward advanced marine engineering, automated outfitting, and specialized vessel retrofitting aimed at compliance with EU shipping decarbonization mandates.

Costal and maritime tourism

Stretching from Musura Bay at the Ukrainian border in the north to Vama Veche at the Bulgarian border in the south, the Romanian Black Sea coast is a cornerstone of the nation's Blue Economy. The region offers a highly diversified maritime tourism portfolio, combining fine sandy beaches and spectacular natural landscapes with established cultural heritage and advanced balneological (spa) resorts. Following a period of robust post-pandemic recovery—which saw the national tourism sector's GDP contribution rise from 2.98% in 2019 to 4.19% in 2023—the coastal hospitality sector experienced a massive influx of capital. In 2024 alone, hotel investments surged by 56% to reach €69.3 million, driving early-season booking revenues up by 32%. Within the broader national context, the Romanian Blue Economy generated approximately €1.5 billion in Gross Value Added (GVA) in 2022. Coastal tourism acts as a massive employment pillar within this framework, accounting for 20% of the national Blue Economy workforce. However, as of 2025

and 2026, the sector is undergoing a strategic recalibration. In response to macroeconomic pressures and shifting consumer behaviors, coastal operators are actively transitioning away from highly concentrated, short-season summer tourism. Instead, the focus is shifting toward climate-resilient, year-round Blue Economy models, heavily leveraging spa, wellness, and multimodal tourism (as seen in the resilience of resorts like Eforie) to stabilize long-term revenue and reduce peak-season environmental stress on coastal ecosystems.

While coastal tourism drives considerable seasonal revenue for local small and medium-sized enterprises (SMEs), it is structurally challenged by extreme seasonality. Activity is concentrated almost entirely within a 4-month summer window along the southern 120 km urbanized beachfront stretching from Năvodari to Mangalia. To mitigate this and attract a broader demographic, the Romanian coastline offers a highly localized and diverse range of experiences:

- **Sulina:** Located where the Danube River meets the Black Sea, Sulina is accessible only by water. It serves as a gateway to the Danube Delta and offers a unique blend of untamed natural landscapes and multicultural history, making it a premier destination for eco-tourism and those looking to escape mass tourism.
- **Mamaia:** Situated just north of Constanța, Mamaia remains the coast's most famous and dynamic resort. Known for its extensively widened beaches, luxury accommodations, and vibrant electronic music scene, it is the undisputed nightlife capital of the Riviera.
- **Eforie Nord and Eforie Sud:** These twin resorts are cornerstones of Romania's health and wellness tourism. They are internationally appreciated for their year-round therapeutic spa facilities, utilizing the mineral-rich waters and highly sought-after sapropelic healing mud from nearby Lake Techirghiol.
- **The Mythological Resorts:** Built during the communist era with names inspired by Greco-Roman gods (Neptun, Venus, Saturn, Jupiter, and Olimp), these resorts feature vast green spaces and family-friendly beaches. Recently, Olimp and Neptun have seen a resurgence of private investment, transforming older properties into modern luxury complexes.
- **Costinești and Vama Veche:** Costinești maintains its laid-back atmosphere as the "Youth Resort," attracting students with its iconic shipwreck and summer music festivals. Vama Veche, located on the Bulgarian border, is famous for its bohemian, free-spirited vibe, remaining the go-to spot for alternative music and beachfront camping.

To appeal to modern travelers and diversify revenue streams beyond the summer months, the coastal region is increasingly highlighting its deep historical roots and pristine biodiversity. The region (ancient Scythia Minor) is rich in archaeological heritage, featuring the ruins of Histria (the oldest urban settlement in Romania), Tomis in Constanța, and Callatis in Mangalia. Cultural anchors like the National History and Archaeology Museum and the recently restored Constanța Casino enhance the region's year-round appeal. Furthermore, for visitors seeking underdeveloped shores, the beaches of Corbu, Vadu, and Perișor offer wild, unspoiled landscapes preserved under the strict environmental protections of the Danube Delta Biosphere Reserve.

Despite its vast potential, the Romanian coastline faces intense regional competition (from Bulgaria, Greece, and Türkiye) and severe structural hurdles. Approximately 75% of all tourist visits are concentrated strictly between mid-June and late August, leading to high economic vulnerability, accelerating coastal erosion requiring state-subsidized beach restoration, and severe environmental pressures from localized urban wastewater runoff during peak volumes. To build a more resilient sector, local authorities and private operators are enacting major strategic initiatives:

- **"Litoralul pentru toți" (The Coast for All):** This successful social program runs annually during the shoulder seasons (May-June and September). By offering accommodation

rates discounted by up to 70%, the program continues to draw hundreds of thousands of domestic tourists, effectively stretching the active season.

- **The National Strategy for Tourism Development 2025-2035:** Adopted in September 2024, this framework aggressively promotes diversification. Key objectives include upgrading transport infrastructure, expanding year-round medical tourism, and promoting MICE (Meetings, Incentives, Conferences, and Exhibitions) events to keep hotels operational outside the summer window.
- **Focus on sustainability:** Both local authorities and the private sector are shifting focus from purely volume-based summer tourism to higher-quality, eco-conscious experiences that protect fragile coastal and delta ecosystems while generating sustainable, year-round economic value.

Marine Living Resources — Fisheries and Aquaculture

The wild-capture fishery sector represents approximately 29% of Romania's Blue Economy employment, yet it struggles with economic efficiency, contributing a lower proportion of Gross Value Added (GVA) that hovers around 22% when combined with primary processing networks. The Romanian Black Sea fleet is predominantly small-scale and artisanal. More than 85% of the active vessels measure under 12 meters in length, operating close to the shore alongside only a small handful of industrialized mid-water trawlers. Commercial marine extraction in Romania's Exclusive Economic Zone (EEZ) is strictly limited by the European Common Fisheries Policy (CFP). This policy enforces annual quota limits to protect the recovering stocks of traditional, heavily exploited target species, most notably the turbot (*Scophthalmus maeoticus*) and European sprat (*Sprattus sprattus*).

Due to historical overfishing and systemic ecological shifts within the Black Sea, the invasive veined rapa whelk (*Rapana venosa*) has emerged as the undisputed economic driver of the Romanian capture sector. First observed in the Black Sea around 1947, this predatory sea snail initially devastated local bivalve populations—such as oysters and blue mussels—because it encountered very few natural predators. However, driven by high international demand, it has become the most commercially important taxon in the region. Harvested largely via beam trawling, which was legally authorized in Romania in 2013, the rapa whelk now dominates total marine landing volumes. It serves as a highly valuable, export-oriented resource destined almost exclusively for Asian markets. Despite this lucrative niche, overall growth in the marine capture sector remains severely constrained. The whelk is currently fished close to its sustainable limits, prompting the General Fisheries Commission for the Mediterranean (GFCM) to launch the BlackSea4Fish project to actively assess and manage the declining stocks. Furthermore, local fleets are held back by aging landing facilities, a lack of modern onboard refrigeration systems, high fuel costs, and ongoing geopolitical and ecological pressures that restrict safe access traditional fishing grounds (Tiganov, 2018).

In 2024, Romania's marine fishery landings from the Black Sea totaled approximately 2,527 tonnes. Historically, marine catches have fluctuated significantly, peaking at over 9,500 tonnes in 2017 before adopting a downward trend due to ecological pressures and fleet capacity reductions. Today, the marine capture sector is almost entirely sustained by a single species: the invasive veined rapa whelk (*Rapana venosa*). This high-value sea snail consistently accounts for over 70% to 85% of the total annual marine landing volumes and is exported primarily to Asian markets. The remainder of the marine catch consists of pelagic and benthic species such as the European sprat (historically around 2% of the catch, though volumes fluctuate), Mediterranean mussels, European anchovy, and the highly prized turbot. Commercial extraction of key species like turbot

and sprat is strictly regulated under the EU's Common Fisheries Policy (CFP), which imposes firm Total Allowable Catches (TACs) to prevent the depletion of vulnerable Black Sea stocks.

Beyond marine capture, the broader sector encompasses a primary processing network and a vital aquaculture industry that are currently navigating significant structural transitions. Because local Black Sea catches are relatively low in volume and highly seasonal, Romania's fish processors face a massive raw material deficit. To maintain year-round operations, the processing sector relies heavily on imported frozen fish—such as herring and mackerel—to meet the vast majority of its production needs. To reduce this heavy reliance on international imports, boost local food security, and reverse declining national production volumes, Romanian policies are actively pivoting toward the modernization of inland and coastal aquaculture. According to European and national market observatories, Romanian aquaculture takes place almost exclusively in freshwater, with production dominated by cyprinids (such as carp cultivated in polyculture) and trout.

Romania's extensive network of inland waters—dominated by the Danube River and the Danube Delta—plays a critical role in the national wild-capture portfolio. In 2024, inland water catches outpaced marine landings, amounting to 3,830 tonnes. The inland catch is predominantly comprised of freshwater species, with Prussian carp serving as the primary catch, followed by freshwater bream, common carp, and Pontic shad. When combining both marine and inland yields, Romania's total annual wild capture stands at roughly 6,357 tonnes. While this capture volume is a vital source of local employment and regional food heritage, it falls short of domestic market demand. To bridge this gap, Romania heavily supplements its wild-capture deficit with both substantial international imports and a growing aquaculture sector, which independently produced over 10,050 tonnes of fish in 2024.

Supported by European funding mechanisms through the Multiannual National Strategic Plan for Aquaculture 2022–2030, the industry's focus is decisively shifting toward sustainable, climate-resilient models that align with the European Green Deal. The national strategy heavily subsidizes the transition away from high-impact intensive farming toward extensive multi-trophic aquaculture—which naturally recycles nutrients and provides ecosystem services like water purification—as well as the adoption of advanced, closed Recirculating Aquaculture Systems (RAS). By promoting these low-emission systems and the organic breeding of indigenous species in regions like the Danube Delta, Romania aims to safely scale its domestic aquatic production to a target of 17,000 tonnes by 2030 while drastically reducing the sector's chemical and carbon footprints.

Aquaculture is predominantly freshwater, and the country's land resources and availability of inland waters provide excellent conditions for fish farming. The number of cultivated species is over 20, and the most important cultured fish species belong to the Cyprinidae family, particularly common carp, as well as bighead, silver, and crucian carps. Other species are trout and sturgeons, and to lesser extent pike-perch, African catfish, and pike among others. In 2024 the aquaculture sector produced 10,059 tonnes. Cyprinids (common carp and bighead carp) and trout were the main farmed species.

The production of species new to Romanian aquaculture, such as sturgeon, is still low. Recently, extensive fish farms have become multifunctional, providing services such as ecological tourism, recreational fishing, and educational activities related to knowledge about and protection of aquatic biodiversity. There is a trend to diversify and increase the current range of aquaculture activities.

There were 41 registered fish processing companies in 2023, which employed 1,384 people, and the production net turnover amounted €186,7 million. Romania's traditional *Salată de Icre* (salad made from carp, pike, and herring roes) was the major product. Fish processors are to a high

degree dependent on imported raw materials: frozen fish or fillets of herring, mackerel, sardine, or sprat. On average, about 80% of the raw material for processing is imported.

Romania is a net importer of fisheries and aquaculture products. In the past several years the volumes have shown a slight upward trend, reaching a volume of 120.461 tonnes and €523 million in value in 2024. More than four-fifths of all imports come from other EU Member States, with the Netherlands, Spain, Poland, Germany and Bulgaria being the top partner countries. Salmon, mackerel, tuna, and trout were the main imported species. Among non-EU countries, Turkey and Vietnam were the main partner countries. Frozen fish still prevail in the structure of imports followed by canned products and chilled fillets.

The volumes of Romania's exports of fisheries and aquaculture products for human consumption have been growing in recent years. In 2024 export volume reached 29.099 tonnes, amounting to €128,1 million. The major export market was the EU (over 60% of the total value), where France, Hungary, Italy, the Netherlands and Poland were the major destinations. Moldova and the United Kingdom were the largest non-EU destinations. Rapa whelk was the largest single species with about half of the overall export value.

Romanian consumers traditionally prefer meat other than fish, and the consumption of fisheries and aquaculture products is far below the EU average. However, the average apparent consumption of fish and seafood has trended upward in recent years, to an estimated 8,75 kg per capita in 2023 (live weight equivalent). Most fish and fisheries products are distributed and sold through supermarket chains. Romanian's household consumption is dominated by live/fresh fish, followed by frozen fish, and marinated and prepared products. The top four preferred species are trout, carp, mackerel, and salmon.

Maritime Cultural Heritage

The Maritime Cultural Heritage sector represents a specialized and rapidly evolving pillar of Romania's Blue Economy, bridging the preservation of ancient history with modern tourism and academic research. The Black Sea coast and the vast ecosystem of the Danube Delta are incredibly rich in archaeological assets and historical monuments. By valorizing these historical sites, Romania is actively diversifying its coastal appeal to attract year-round cultural tourism, thereby reducing the economic vulnerability associated with the short summer beach season.

Architectural Heritage and the Constanța Casino A defining recent achievement for the regional Blue Economy is the historic restoration of the Constanța Casino, widely considered the architectural crown jewel of the Romanian Riviera. Originally inaugurated in 1910 and constructed in a striking Art Nouveau style, the building had suffered decades of neglect and was in a very advanced state of degradation by the 21st century. Recognizing its vital importance to local identity and the tourism economy, a massive capital restoration project was initiated in April 2020. The complex rehabilitation process lasted five years and required a financial investment exceeding RON 200 million (approximately €40 million), far surpassing initial budget estimates. Following this extensive effort, the meticulously restored Casino officially reopened to visitors on May 21, 2025, successfully reclaiming its status as a major cultural anchor for the city of Constanța.

Beneath the surface, the Romanian Black Sea and the Danube Delta hold immense potential for underwater archaeology. One of the most significant discoveries in this domain is the underwater tell of Taraschina, located in the central wetlands of the Danube Delta. Excavated by a joint French-Romanian multidisciplinary archaeological mission, this submerged artificial mound provides crucial insights into the Chalcolithic communities that inhabited the region over 6,000 years ago. Because the Black Sea experienced a rapid sea-level rise during the early Holocene—roughly 8,000 years ago—vast continental plains were flooded, creating the modern delta and

submerging numerous prehistoric landscapes. Experts assess that a large number of undiscovered ancient sites remain preserved beneath the coastal waters and deltaic sediment, offering huge potential for future scientific tourism. Alongside these submerged prehistoric sites, the ancient Greco-Roman port cities of Scythia Minor—such as Tomis, Callatis, and Histria—continue to drive terrestrial heritage tourism along the immediate shoreline.

To fully integrate this cultural heritage into the modern economic landscape, Romania actively participates in international and sea-basin initiatives. A prime example is the "Blue Gates" project, a cross-border partnership uniting institutions from Romania, Bulgaria, Ukraine, and Türkiye to unlock the economic potential of the Black Sea. With the participation of key local entities like the Constanța-based Black Sea Universities Network (BSUN), the project explicitly focuses on underwater cultural heritage as a key developmental sector alongside maritime transport, fishing, and coastal tourism. By treating submerged archaeology and coastal monuments not merely as scientific curiosities, but as vital assets for sustainable and experiential tourism, Romania is effectively converting its ancient maritime past into future economic resilience.

Marine renewable energy

The marine renewable energy sector, specifically offshore wind, represents the most significant emerging frontier within Romania's blue economy. Offshore renewable energy, including wind and wave energy, is recognized as one of the most promising sectors for sustainable innovation and long-term economic growth within the broader maritime economy. Driven by the ambitious decarbonization objectives of the European Green Deal, the Black Sea is increasingly prioritized for renewable energy expansion. The northwestern sector off the Romanian coast is particularly energetic, providing highly favorable meteorological conditions for wind power development. Estimates assessing the technical capacity of the region suggest that the Romanian offshore area holds a theoretical potential of at least 76 Gigawatts (GW) of wind energy. Because much of this high-yield potential is located in deeper waters, harnessing this capacity will heavily rely on the future deployment of floating offshore wind turbines, operating alongside traditional fixed-bottom structures in shallower coastal zones (Elston, 2024).

Historically, Romania's wind energy success was confined entirely to onshore projects—particularly in the high-performance Dobrogea corridor—while the offshore sector remained stalled by a lack of legislation. This structural barrier was recently dismantled. To enable and incentivize the development of offshore wind farms in the Romanian Exclusive Economic Zone (EEZ) of the Black Sea, the government adopted critical legislation establishing applicable procedures, institutional roles, and developer rights through the enactment of Law no. 121/2024. By creating legal and regulatory certainty, this framework officially transitions the Romanian Black Sea from a zone of theoretical potential into a highly attractive, bankable market for foreign and domestic renewable energy investments.

The development of offshore wind energy in Romania acts as a transformative catalyst for the entire blue economy framework. The rapid advancement of renewable energy technologies, including offshore wind farms, provides a vital mechanism to accomplish deep decarbonization in adjacent maritime industries and significantly reduce reliance on fossil fuels. Furthermore, as spatial competition intensifies in the Black Sea between energy developers, traditional fisheries, and maritime transport routes, academic and policy frameworks are increasingly exploring multi-use platforms. These innovative platforms propose the physical integration of offshore wind infrastructure with other marine activities, such as aquaculture operations, to maximize spatial efficiency. By embracing these synergistic approaches, Romania aims to ensure that the massive industrialization of its offshore wind sector supports the long-term socioeconomic resilience of its coastal communities without compromising the ecological health of the marine environment (Manolache, 2024).

Marine biotechnology

Marine (or "Blue") biotechnology represents a highly specialized and rapidly emerging pillar of Romania's Blue Economy. While traditional sectors like maritime transport and capture fisheries operate on high-volume extraction or logistics, marine biotechnology focuses on the advanced exploration and exploitation of aquatic organisms—such as microalgae, macroalgae, bacteria, and invertebrates. The objective is to convert marine biomass into high-value products, including natural cosmetics, novel pharmaceuticals, bio-packaging, and advanced nutritional supplements. In Romania, this sector is currently undergoing a critical transition, shifting from a strictly academic and research-oriented field into an economically viable, commercial industry capable of capturing a share of the rapidly expanding European bioeconomy market.

The development of this high-tech sector is fundamentally anchored by the National Institute for Marine Research and Development "Grigore Antipa" (INCDM) in Constanța, working in close collaboration with academic consortiums like the Black Sea Universities Network. INCDM acts as the central node for national innovation, driving multi-year research projects that align local biological potential with the mandates of the European Green Deal. A flagship initiative in this space is the EX-AQUA project (running through 2027). This strategic program aims to firmly position the Romanian Black Sea region on the map of advanced marine aquaculture. By developing specific, scalable cultivation technologies adapted to the unique conditions of the Black Sea, the project focuses on cultivating microalgae and macroalgae (such as *Ulva* and *Cystoseira barbata*) to serve as strategic raw materials for green industries, pharmaceuticals, and next-generation biofuels. In March 2026, Mare Nostrum started a five-year coastal restoration program in the Black Sea, with support of DP World aimed at creating "underwater forests" near the Constanța South Container Terminal. The initiative is led by the Constanța-based environmental NGO Mare Nostrum and focuses on restoring native marine habitats that have degraded over recent decades due to pollution and human activity.

The applications of marine biotechnology in Romania are uniquely positioned to serve a dual purpose: driving economic competitiveness while simultaneously executing ecological restoration. On the commercial front, researchers and early-stage startups are exploring the extraction of bioactive compounds to modernize Romania's historical health and wellness sector. This involves moving beyond the traditional therapeutic use of sapropelic mud (from Lake Techirghiol) to isolate specific marine enzymes and biopolymers for advanced cosmeceuticals. On the environmental front, blue biotechnology deploys "nature-based solutions" directly into the marine ecosystem. For example, cultivated macroalgae beds act as natural bio-filters; they actively recycle excess agricultural nutrients washing into the sea from the Danube, oxygenate the coastal waters, and combat eutrophication, all while generating harvestable biomass.

Despite its vast theoretical potential, the Romanian blue biotechnology sector faces significant structural hurdles that prevent rapid commercialization. The industry is highly capital-intensive, requiring specialized laboratory infrastructure, prolonged testing phases, and a workforce highly trained in advanced STEM disciplines. Furthermore, there is a pronounced "valley of death" between laboratory breakthroughs and commercial market entry due to limited domestic technology transfer mechanisms and a lack of early-stage venture capital. To overcome these barriers, the sector relies heavily on targeted European funding frameworks, including Horizon Europe, the European Maritime, Fisheries and Aquaculture Fund (EMFAF), and the Smart Specialization Strategy (RIS3) for the South-East Region. By funneling these funds into collaborative projects between public institutes and private enterprise, Romania aims to build the resilient, knowledge-based blue bioeconomy required for the future.

Ocean monitoring and marine data

Ocean monitoring and marine data collection constitute a foundational pillar of Romania's emerging blue economy, providing the critical scientific baseline required for sustainable maritime operations and climate resilience. The sector is driven by national research hubs such as the National Institute for Marine Research and Development "Grigore Antipa" (NIMRD) and the National Institute for Research and Development for Marine Geology and Geoecology (GeoEcoMar), which manage complex coastal observation networks, real-time early warning systems, and precise hydrodynamic models of the Black Sea. These national infrastructures are increasingly integrated into broader European frameworks, including the European Marine Observation and Data Network (EMODnet) and the Copernicus Marine Service, ensuring that Romanian marine data is interoperable and accessible for commercial downstream products. By transitioning from fragmented local monitoring to cohesive, continent-wide systems, marine research infrastructures empower established blue economy sectors like maritime transport and coastal tourism, while actively de-risking investments in emerging sectors such as offshore wind and marine biotechnology (Dañobeitia et al., 2023).

Beyond raw data collection, Romania's ocean monitoring sector directly translates marine observation into applied forecasting models that safeguard the ecological and economic viability of the Black Sea and the Lower Danube Euroregion. Accurate physicochemical monitoring—tracking variables such as total nitrogen, phosphorus, water temperature, and dissolved oxygen—serves as an essential tool for managing biodiversity loss and mitigating the impacts of climate change on vital fish stocks and aquatic resources (Petrea et al., 2021). Furthermore, recent multi-national initiatives like the EU-funded DOORS and BRIDGE-BS projects highlight the critical role of participatory marine data ecosystems in bridging policy gaps and fostering a sustainable blue economy in the region. By engaging academia, industry, and local communities, these monitoring frameworks facilitate science-based decision-making for marine spatial planning, fisheries management, and sustainable offshore development across the highly stressed Black Sea basin (Seyhan et al., 2025).

Marine infrastructure

Maritime infrastructure in Romania, encompassing submarine cables, offshore pipelines, and coastal engineering, is undergoing a massive expansion, securing the nation's status as a critical energy and digital node within the European Union. The exploitation of significant offshore natural gas reserves—spearheaded by the €4.7 billion Neptun Deep project and the operational Midia Gas Development—necessitates the installation of highly complex deep-water production systems. This includes over 160 kilometers of subsea flowlines, umbilicals, and trunk pipelines connecting offshore platforms to onshore processing facilities at Tuzla and Vadu. Concurrently, regional connectivity is being redefined by the planned Black Sea Submarine Cable (BSSC) project. This ambitious 1,155-kilometer high-voltage direct current (HVDC) interconnector, coupled with parallel fiber-optic networks, is designed to link the South Caucasus to the Romanian grid. By integrating offshore energy extraction with future renewable power transmission and critical digital telecommunications, these submarine assets are foundational to Europe's geoeconomic resilience and energy security strategies (World Bank, 2024).

Parallel to these deep-water developments, robust coastal engineering is vital for mitigating severe coastal erosion along the Romanian shoreline and adapting to climate-induced sea-level rise. The interaction of natural hydrodynamic processes, changing wave regimes, and anthropogenic pressures has historically compromised key littoral zones, threatening both the lucrative tourism economy and critical maritime real estate. In response, Romania is executing some of the largest coastal protection and rehabilitation operations in the Black Sea basin—particularly across Constanța, Mamaia, and Eforie—financed heavily by European structural

funds. These integrated coastal zone management (ICZM) interventions combine "soft" engineering, such as extensive beach nourishment utilizing millions of cubic meters of dredged offshore sand, with "hard" stabilization structures like submerged breakwaters and groynes. Beyond safeguarding the socio-economic vitality of coastal resorts, these major engineering works are designed to halt shoreline retreat, buffer severe storm surges, and restore degraded shallow-water habitats, ensuring the long-term geomorphological stability of the coast (Jugănaru & Jugănaru, 2021).

Other sectors

In Romania, marine ecosystem protection and blue carbon are emerging as deeply interconnected, high-priority sectors within the national blue economy strategy, driven by EU biodiversity targets and climate mitigation frameworks. Current efforts focus heavily on the restoration of critical coastal habitats that have suffered from historical anthropogenic pressures. A prominent example is the ongoing initiative to replant "underwater forests" of native brown algae (*Cystoseira barbata*) along the Constanța coastline, implemented by international partnerships alongside local environmental groups like Mare Nostrum. Beyond restoring crucial nursery grounds for endemic marine life and stabilizing coastal geomorphology, these macroalgae habitats—along with regional seagrass meadows—are being actively monitored for their carbon sequestration potential. Supported by pan-European research consortiums like BRIDGE-BS and REST-COAST, Romania is transitioning from passive marine conservation to active ecological regeneration, establishing blue carbon not just as a scientific metric, but as a prospective climate-financing asset for the Black Sea region (Salihoglu et al., 2024)

Conversely, seabed mining and marine desalination remain nascent, highly restricted, or economically unnecessary sectors within Romania's maritime domain. Seabed mining is not commercially active, though it remains a subject of intense scientific assessment led by national institutes such as GeoEcoMar. The western Black Sea basin contains massive volumes of methane locked in shallow gas hydrates—estimated at over 14,000 megatons of carbon—alongside deep-water sapropelic muds (Burwicz-Galerie et al., 2024). However, any future extractive operations face severe technological and environmental hurdles, notably the Black Sea's unique anoxic deeper layers, strict EU moratoriums on deep-sea mining, and the high risk of disturbing toxic hydrogen sulfide concentrations. Similarly, desalination holds an extremely low priority as a commercial blue economy sector. Thanks to the massive freshwater influx provided by the Danube River, Romania's coastal and inland water demands are amply met, confining desalination technologies strictly to highly specialized, small-scale industrial niches rather than municipal or agricultural water supply.

Together, the status of these four sectors illustrates Romania's strategic pivot toward a regenerative, rather than purely extractive, blue economy. By prioritizing marine ecosystem restoration and pioneering blue carbon assessments, Romania is aligning its coastal management with the European Green Deal and nature-based climate solutions. Meanwhile, the deliberate stagnation of potentially disruptive sectors like seabed mining underscores a precautionary approach to the fragile, highly stratified Black Sea environment. As regional initiatives like the DOORS and BRIDGE-BS projects continue to map the basin's ecological boundaries, Romania's blue economy is increasingly characterized by leveraging marine ecosystems for climate resilience and environmental sustainability, rather than exploiting deep-sea minerals or chemically altering seawater.

Romania's blue economy: target groups matrix

The following matrix categorizes the primary actors across the established and emerging sectors of Romania's blue economy, outlining their core activities, strategic needs, and the challenges they face.

Table 2 – Target groups matrix

Sector	Key Actors / Target Groups	Core Role & Activities	Strategic Needs & Challenges
Ports & Logistics	Port of Constanța administration, terminal operators (container, bulk, Ro-Ro), TRACECA members.	Facilitate major regional trade, multimodal logistics, and transshipment of agricultural bulk and energy resources.	Adapting to geopolitical shifts, digitalizing traffic management, and financing decarbonization (e.g., shore-side electricity, alternative fuels).
Shipbuilding	Constanța Shipyard (SNC), Vard Tulcea, Damen Shipyards Mangalia.	Complex vessel repair, conversion, and specialized high-tech construction (offshore support, eco-ferries).	Mitigating workforce contraction, pivoting from traditional bulk carriers to eco-friendly tonnage, and servicing offshore wind infrastructure.
Coastal Tourism & Heritage	Hotel owners, local SMEs, balneological (spa) facilities, cultural institutions, local authorities.	Provide hospitality, wellness tourism (e.g., Lake Techirghiol mud), and manage heritage sites (e.g., Constanța Casino).	Overcoming extreme 4-month summer seasonality, minimizing environmental stress, and developing year-round eco/cultural tourism.
Fisheries & Aquaculture	Small-scale/artisanal fishers, aquaculture farmers (RAS & extensive), processing companies.	Extract marine resources (e.g., rapa whelk), cultivate freshwater species (cyprinids, trout), and process seafood.	Combating overfishing/ecological limits, addressing raw material deficits for processors, and scaling climate-resilient aquaculture.
Marine Renewable Energy	Private energy developers, government regulators, offshore wind investors.	Capitalize on the 76 GW theoretical offshore wind potential in the Black Sea using fixed and floating turbines.	Utilizing the newly established Law 121/2024 to secure bankable investments and navigating spatial competition via multi-use platforms.

Marine Biotechnology	Research institutes (INCDM "Grigore Antipa"), academic consortiums (BSUN), NGOs (Mare Nostrum), early-stage startups.	Cultivate macroalgae/microalgae, develop cosmeceuticals, and execute coastal restoration (e.g., underwater forests).	Overcoming the "valley of death" between lab research and commercialization, securing venture capital, and building specialized STEM workforces.
Ocean Monitoring & Data	INCDM, GeoEcoMar, international consortiums (DOORS, BRIDGE-BS, EMODnet).	Provide physicochemical monitoring, real-time early warning systems, and precise hydrodynamic models.	Integrating localized data into interoperable European frameworks to de-risk investments and monitor climate/biodiversity impacts.
Marine Infrastructure	O&G companies (Neptun Deep), grid operators (BSSC project), coastal engineering firms.	Install deep-water gas pipelines, high-voltage submarine cables, and execute coastal anti-erosion engineering.	Balancing large-scale extraction/connectivity with environmental protection, and halting climate-induced shoreline retreat.

Transitioning Romania's maritime spaces from policy to practice requires a granular understanding of these diverse target groups. Although the blue economy's direct statistical footprint is modest—generating roughly €1.5 billion in Gross Value Added (0.6% of GDP) and employing over 65,000 people—its indirect multiplier effect is massive, anchoring Romania's foreign trade and regional energy security.

The Industrial core and geopolitical resilience

The bedrock of Romania's blue economy is highly industrialized. Ports and logistics (17.4% of GVA) and shipbuilding (32.4% of GVA) dominate the landscape. Stakeholders in these sectors are currently operating under intense geopolitical pressure due to the war in Ukraine, which has reconfigured regional supply chains and driven unprecedented transit cargo through the Port of Constanța. For these target groups, the primary challenge is modernization. Shipyards like Vard Tulcea and SNC are successfully surviving by pivoting away from low-cost labor and focusing on high-tech engineering, preparing to act as the supply chain backbone for the emerging offshore wind sector.

The Transition to a "Green" and knowledge-based economy

A shared structural challenge across almost all target groups is the mandate to decarbonize and protect biodiversity, heavily influenced by EU funding mechanisms (EMFAF, Horizon Europe) and the European Green Deal.

- **Energy and tech:** Private energy developers and research institutes like INCDM and GeoEcoMar are the vanguard of this transition. They are shifting the focus toward marine renewable energy (offshore wind) and blue biotechnology (macroalgae cultivation).

- **Regeneration over extraction:** Actors are actively moving away from purely extractive models. For instance, seabed mining remains intentionally stalled due to environmental risks, while NGOs like Mare Nostrum are funded to actively restore "underwater forests" for blue carbon sequestration and ecosystem regeneration.

Economic vulnerability in tourism and primary production

Stakeholders in coastal tourism and living resources (fisheries/aquaculture) share a high degree of economic vulnerability.

- **Tourism:** Local SMEs and coastal operators are hampered by extreme seasonality, with 75% of visits occurring in a short summer window. The strategic response involves leveraging cultural heritage (like the newly restored Constanța Casino) and wellness tourism (Eforie resorts) to stretch the season and attract year-round revenue.
- **Fisheries:** The marine capture sector is heavily reliant on a single invasive species (the rapa whelk) destined for Asian markets, while fish processors rely on 80% imported raw material. Policymakers and farmers are addressing this by directing European funds toward modern, closed Recirculating Aquaculture Systems (RAS) to safely scale domestic production and improve food security.

Romania's blue economy stakeholders are navigating a complex transition. To ensure sustainable growth, policymakers must continue to use precise, target-group-specific mapping to deploy European funds. By connecting the heavy industrial players (ports and shipyards) with the knowledge creators (institutes and academia) and the environmental protectors (NGOs), Romania can leverage its maritime assets to stimulate economic recovery while simultaneously restoring the ecological health of the Black Sea and the Danube Delta.

Funding instruments for the blue economy

The realization of a sustainable, climate-neutral blue economy in Romania is underpinned by a rapidly maturing ecosystem of funding instruments. Historically driven by traditional fisheries and maritime transport subsidies, the current financial landscape—anchored in the European Union's 2021–2027 Multiannual Financial Framework and the European Green Deal—has shifted toward capitalizing ecological transitions, digital modernization, and climate resilience. This strategic redirection ensures that both established maritime industries and emerging sectors, such as offshore renewables and blue biotechnology, have access to the targeted capital required to de-risk technological innovation and scale sustainable practices across the Black Sea basin.

Furthermore, the funding architecture in Romania has evolved from relying exclusively on public grants to a blended finance model. Today, pan-European research consortia, national operational programs, and pioneering private-sector "blue finance" initiatives operate in tandem. This multi-level approach empowers a broad spectrum of stakeholders—from deep-tech marine startups and local aquaculture cooperatives to large-scale coastal infrastructure developers—to align their commercial objectives with stringent environmental restoration targets, fostering a truly regenerative maritime economy.

National funding programs

The Aquaculture and Fisheries Program (PAP) 2021–2027 (<https://oportunitati-ue.gov.ro/program/programul-pentru-acvacultura-si-pescuit/>)

The Aquaculture and Fisheries Program (PAP) 2021–2027 serves as the cornerstone of Romania's blue economy financing. With a total budget of €232 million—comprising €162.4

million from the EU's EMFAF and nearly €70 million in national co-financing—PAP represents a critical shift away from simply expanding fishing capacity toward deep ecological and technological modernization. It aligns directly with the EU Green Deal and the Common Fisheries Policy, effectively tying financial support to environmental compliance.

Under the PAP framework, modernization means decoupling economic growth from resource depletion. The program heavily subsidizes the transition to low-impact operations, funding the adoption of alternative energy sources—such as solar installations for processing plants—and energy-efficient propulsion systems for the fishing fleet. On the digital front, investments target the digitalization of fleet monitoring, precise environmental data collection, and advanced supply-chain traceability, ensuring that Romanian seafood can be reliably tracked from "farm to fork."

The €108 million earmarked for this pillar goes far beyond just building more fish farms; it is designed to adapt Romania's aquatic food systems to climate change. Key funding targets include:

- **Circular water systems:** Co-financing the construction of Recirculating Aquaculture Systems (RAS) that drastically reduce water consumption and prevent localized nutrient pollution.
- **Species adaptation:** Supporting R&D and operational shifts toward aquatic species that are more resilient to the rising water temperatures and changing salinity of the Black Sea and Danube basin.
- **High-value processing:** Upgrading processing facilities to minimize waste, improve animal welfare standards, and transition toward certified organic aquaculture products.

A major socio-economic challenge in Romania's coastal zones and the Danube Delta is the historical over-reliance on declining wild fish stocks, such as sturgeon and turbot. PAP addresses this through the Community-Led Local Development (CLLD) framework, deploying funds directly to Fisheries Local Action Groups (FLAGs). Rather than using a top-down approach, these local coalitions receive grants to create alternative, sustainable livelihoods. This empowers communities to launch ventures in coastal eco-tourism, direct-to-consumer artisanal markets, and small-scale blue bioeconomy projects, thereby diversifying local incomes and reducing the harvesting pressure on vulnerable fishing grounds.

While PAP is an economic instrument, it integrates heavily with Romania's environmental commitments. The program dedicates specific interventions to protecting marine biodiversity. This includes funding the monitoring and management of marine Natura 2000 protected areas, supporting scientific research on the Black Sea's shifting ecosystems, and financing direct actions by fishermen to collect and remove marine litter.

The National Recovery and Resilience Plan (PNRR)

The PNRR serves as Romania's rapid-deployment mechanism for post-pandemic structural reforms, heavily prioritizing the digital and green transition of national infrastructure. Within the maritime sector, the PNRR's primary target is the modernization and decarbonization of the Port of Constanța, a critical node in the Trans-European Transport Network (TEN-T). By financing the shift away from legacy fossil-fuel logistics, this instrument makes Romania an attractive, compliant hub for global shipping lines facing strict international emissions regulations.

Key PNRR investments in the maritime space include:

- **Port decarbonization and shore power:** Upgrading the electrical distribution grids within port terminals to enable "cold ironing." This allows docked vessels to turn off their auxiliary diesel engines and draw electricity directly from the onshore grid, drastically reducing localized air pollution and greenhouse gas emissions.
- **Digitalization of logistics:** Funding the implementation of a comprehensive Port Community System. This digital platform automates cargo-flow and customs processing,

reducing logistical bottlenecks and cutting the carbon emissions generated by idling truck and rail freight.

- **Intermodal transport integration:** Rehabilitating internal port rail networks and dredging critical waterways to facilitate a modal shift. By moving freight off high-emission road transport and onto sustainable rail and inland barge routes along the Danube, the PNRR aligns Romania with the EU's sustainable mobility targets.

The Sustainable Development Program (SDP / PDD) 2021–2027

While the PNRR focuses on logistics and transport, the Sustainable Development Program (known nationally as PDD) serves as the primary financial engine for climate adaptation, coastal resilience, and environmental engineering. Backed by the EU's Cohesion Fund, the SDP manages massive capital injections designed to protect Romania's coastal geomorphology and marine ecosystems from anthropogenic pressures and climate-induced threats.

Key SDP interventions include:

- **Mitigating coastal erosion:** The SDP heavily finances Romania's integrated coastal zone management (ICZM) mega-projects. This involves extensive beach nourishment operations across vulnerable areas like Constanța, Mamaia, and Eforie, utilizing millions of cubic meters of dredged offshore sand. These efforts are reinforced by "hard" stabilization structures—such as submerged breakwaters and groynes—to absorb storm surges and halt shoreline retreat.
- **Wastewater and pollution management:** To ensure the ecological viability of the Black Sea, the SDP allocates substantial capital to upgrading municipal wastewater treatment networks along the littoral zone. Preventing terrestrial runoff and untreated discharges from entering the sea is essential for protecting the water quality required by both the lucrative coastal tourism sector and the emerging aquaculture industry.
- **Biodiversity protection:** By stabilizing the coastline and improving marine water quality, these civil engineering works also support the restoration of degraded shallow-water habitats, acting as a foundational investment in the region's overall environmental health.

Modernisation Fund (Fondul pentru Modernizare)

Managed by the Ministry of Energy and financed through the EU Emissions Trading System (EU ETS), the Modernisation Fund is currently one of the largest capital pools available in Romania for the green transition. For the blue economy, this fund is the critical enabler for the emerging offshore wind sector. As Romania prepares to auction its first offshore wind concessions in the Black Sea, the Modernisation Fund provides the massive capital required to upgrade the onshore national power grid to handle incoming high-voltage submarine cables. Furthermore, it finances renewable energy integration and storage capacities for coastal municipalities and maritime authorities, laying the groundwork for electrified, zero-emission coastal infrastructure.

The South-East Regional Program (PR Sud-Est 2021–2027)

While national in its framework, Regional Programs are decentralized to specific territorial agencies. The South-East Regional Program, managed by the South-East Regional Development Agency (ADR SE), is highly relevant because it covers Romania's maritime counties: Constanța and Tulcea. With a budget of nearly €1.5 billion, this instrument acts as the primary financial lifeline for coastal microenterprises and SMEs. It directly funds the digitalization of local maritime businesses, the sustainable modernization of coastal tourism infrastructure, and regional technology transfer. For a blue economy startup—such as a local maritime logistics tech firm or

a sustainable eco-tourism operator in the Danube Delta—PR Sud-Est provides the targeted grants and financial instruments (like subsidized loans) that larger national mechanisms often overlook.

National Plan for Research, Development and Innovation (PNCDI IV 2022–2027)

Managed by the Ministry of Research, Innovation and Digitalization through UEFISCDI, PNCDI IV is the domestic backbone for marine science. The blue economy cannot function without high-quality environmental data. This program finances the fundamental and applied exploratory research conducted by national hubs like INCDM ("Grigore Antipa") and GeoEcoMar. Through its various funding pillars—such as Exploratory Research Projects and technology transfer grants—PNCDI IV finances the development of marine early warning systems, hydrodynamic modeling, and blue carbon assessments. It acts as the critical domestic matching fund that allows Romanian scientists to map the Black Sea's resources before commercial sectors attempt to utilize them.

The Environmental Fund (Administrația Fondului pentru Mediu - AFM)

Operating as a strictly national financial instrument, the AFM is managed by the Ministry of Environment, Water and Forests. It is capitalized primarily through national eco-taxes, emissions trading revenues, and penalties for environmental non-compliance. While it is a general environmental fund rather than a dedicated "blue" one, the AFM is a crucial lifeline for coastal municipalities and the Danube Delta. It provides direct, non-reimbursable grants for local wastewater treatment systems, the closure of non-compliant coastal landfills, and the installation of photovoltaic panels for local maritime businesses and public buildings. For small-scale, localized environmental remediation along the shoreline, the AFM is often the most accessible source of domestic capital.

Connecting Europe Facility (CEF - Transport)

While the PNRR handles domestic logistics modernization, the Connecting Europe Facility is the heavy-duty instrument used when Romania's maritime infrastructure serves the broader European market. CEF is highly active in Romania, specifically targeting the integration of the Port of Constanța and the Danube-Black Sea Canal into the wider Trans-European Transport Network (TEN-T). For example, CEF is currently co-financing major multi-million euro initiatives to install onshore power supply ("cold ironing") across multiple berths in Constanța, allowing massive cargo and cruise ships to run on electricity rather than heavily polluting bunker fuel while docked.

European funding instruments

While national and structural funds provide the foundation for Romania's maritime infrastructure, the most advanced technological and ecological innovations are financed directly through centralized European funding mechanisms. Managed directly by the European Commission or its executive agencies, these instruments are highly competitive, requiring Romanian research institutes, startups, and large enterprises to form transnational consortiums. They are designed to bridge the gap between early-stage marine research and full-scale commercialization.

EU Mission: "Restore Our Ocean and Waters" (Danube & Black Sea Lighthouse)

Operating as a flagship initiative under the Horizon Europe framework, the EU Mission: "Restore Our Ocean and Waters by 2030" represents a radical departure from traditional infrastructure funding. Instead of financing conventional concrete-and-steel engineering, this mechanism treats Europe's major water systems as interconnected living entities. Through the Danube & Black Sea

Lighthouse, the entire water column from the Black Forest to the Romanian coastline is managed as a single, contiguous ecosystem. This "lighthouse" acts as a massive regional incubator, deploying millions of euros in innovation grants to pilot, test, and scale nature-based solutions and circular blue economy models.

Because Romania controls both the primary discharge point of the Danube and a critical stretch of the Black Sea, it serves as the geographical and scientific anchor for this Lighthouse. National research bodies—most notably the Danube Delta National Institute for Research and Development (DDNI) and the National Institute for Research and Development in Environmental Protection (INCDPM)—are leading multi-national consortiums to reverse decades of ecological degradation while creating new, sustainable economic models for coastal and riverine communities.

Rather than funding traditional dredging or the construction of concrete embankments, Lighthouse grants finance "blue-green infrastructure." The goal is to let nature do the heavy lifting of water filtration, flood mitigation, and carbon sequestration. In Romania, this translates directly into the funding of massive wetland and floodplain restoration projects across the Lower Danube and the Danube Delta. By reconnecting isolated lakes and restoring natural water flows, these projects revitalize fish spawning grounds and naturally filter out agricultural pollutants before they can reach the anoxic depths of the Black Sea.

The Lighthouse mechanism deploys capital through targeted "Innovation Actions" (IAs). Two of the most prominent multi-million-euro projects actively operating in Romania include:

- **DaWetRest (Danube Wetlands Restoration):** This €9.1 million initiative focuses heavily on the Danube Delta as a primary demonstrator site. In Romania, researchers and local SMEs are co-developing sustainable ways to exploit local bio-resources, such as using Phragmites (reeds) for carbon sequestration and eco-friendly construction materials. It proves that restoring wetlands does not mean shutting out the local economy; rather, it creates new, sustainable revenue streams for Delta communities.
- **DALIA (Danube Region Water Lighthouse Action):** Focusing on the restoration of freshwater ecosystems, this massive 22-partner project maps pollution and chemical degradation along the river. In Romania, DALIA funds the deployment of digital monitoring tools and predictive models that help authorities make real-time decisions regarding water management, directly supporting the ecological recovery needed to sustain local aquaculture and eco-tourism.

A defining feature of Lighthouse funding is the mandatory inclusion of "Living Labs." These are not isolated academic studies; they are real-world testing grounds where scientists, deep-tech startups, policymakers, and local citizens co-create and validate solutions. In the Romanian context, these labs are used to test cutting-edge blue technologies before commercialization. Examples include validating bio-based water filtration systems, testing zero-emission local ferries for Delta transport, and developing digital platforms that help local fishermen transition into environmental monitors. By de-risking these early-stage technologies, the Lighthouse bridges the "valley of death" between scientific research and commercial application, ensuring that the future Black Sea blue economy is both profitable and regenerative.

Interreg NEXT Black Sea Basin Programme 2021–2027

Although financed primarily by the European Union through the Neighbourhood, Development and International Cooperation Instrument (NDICI), the Interreg NEXT Black Sea Basin Programme 2021–2027 is functionally and administratively rooted in Romania. The Romanian Ministry of Development, Public Works and Administration acts as the Managing Authority for the entire multi-national mechanism, while the Joint Secretariat is hosted locally by the South-East Regional Development Agency in Constanța. This central role positions Romania as the primary

coordinator for cross-border maritime cooperation across the basin, managing a total regional budget of approximately €72 million.

Because marine ecosystems, ocean currents, and pollution do not respect national borders, the Interreg NEXT framework operates on the premise that isolated, single-country interventions in the Black Sea are ineffective. The program mandates that every funded project must be a transnational consortium, requiring Romanian stakeholders to partner directly with counterparts in Bulgaria, Greece, Turkey, Georgia, Ukraine, the Republic of Moldova, or Armenia.

Priority 1: A Blue and Smart Region

A significant portion of the budget is dedicated to the integration of advanced technologies and research into the blue economy. Interreg NEXT finances cross-border technology transfer, encouraging universities and maritime businesses to co-develop smart solutions. In Romania, this translates into funding for:

- **Intelligent Ocean Monitoring:** Grants for the deployment of shared digital platforms and Artificial Intelligence (AI) tools that improve the forecasting of Black Sea hydro-dynamics.
- **Sustainable Fisheries and Aquaculture:** Financing joint research between Romanian and international institutes to develop innovative, low-impact aquaculture technologies and sustainable fishing practices that can be shared across the basin.

Priority 2: A Clean and Green Region

The environmental health of the Black Sea is severely compromised by diverse anthropogenic pressures, from Danube river runoff to industrial shipping. Interreg NEXT tackles this by funding macro-regional climate adaptation and disaster risk prevention. Key funding avenues include:

- **Cross-Border Pollution Management:** Capital is deployed to create joint early-warning systems and shared protocols for managing marine pollution, including oil spills and agricultural runoff. It also funds transnational actions for the collection, reduction, and recycling of marine and riverine litter (such as plastics washing up on the Romanian coast from neighboring countries).
- **Biodiversity and Green Infrastructure:** The program finances the protection of shared natural heritage and the restoration of green-blue infrastructure. This includes joint conservation efforts for migratory marine species (like Black Sea cetaceans) and the preservation of vital coastal wetlands that span national borders

Beyond strict technology and environmental monitoring, the program also finances "people-to-people" actions designed to build mutual trust and socio-economic resilience among coastal communities. This is particularly relevant for the **coastal tourism sector**. Interreg NEXT provides essential capital for the development of cross-border eco-tourism routes and shared cultural heritage initiatives. By linking the Romanian coastline (e.g., the Danube Delta) with protected marine areas in Bulgaria or Georgia, the fund helps local tourism SMEs create diversified, high-value eco-tourism packages that attract international visitors to the broader Black Sea region, reducing the reliance on high-volume, seasonal beach tourism.

Horizon Europe (Clusters 5 & 6)

Beyond the specific "Lighthouse" missions, Horizon Europe is the EU's flagship €95.5 billion research and innovation framework. For the blue economy, funding is primarily channeled through two thematic clusters:

- **Cluster 5 (Climate, Energy, and Mobility):** This pillar finances the "heavy tech" transition of the maritime sector. It provides massive multi-million-euro grants to develop next-generation offshore renewable technologies (such as floating wind and wave energy) and to decarbonize maritime transport by funding research into alternative marine fuels (ammonia, hydrogen) and zero-emission vessel designs.

- **Cluster 6 (Food, Bioeconomy, Natural Resources, Agriculture, and Environment):** This cluster focuses on the biological and ecological aspects of the sea. Romanian universities and aquaculture enterprises utilize these funds to pioneer sustainable, climate-resilient seafood production, develop marine biotechnology (extracting high-value compounds from algae), and deploy advanced digital ocean observation systems.

InvestEU and the BlueInvest Initiative

Unlike traditional grants that give non-reimbursable money, the InvestEU program provides financial guarantees to de-risk private capital investments. For the maritime sector, this is operationalized through BlueInvest, a dedicated platform bridging the gap between innovative blue startups and European venture capital.

- **Access to equity:** BlueInvest targets early-stage businesses, scale-ups, and SMEs. If a Romanian startup develops a new underwater autonomous drone or a bio-based water filtration system, BlueInvest provides investment-readiness coaching and connects them directly with investors looking for sustainable ocean tech.
- **Market scale-up:** By leveraging the InvestEU guarantee, the platform helps mobilize private equity to scale up high-risk, high-reward blue economy companies that traditional commercial banks would typically refuse to finance.

The LIFE Programme

As the EU's dedicated funding instrument for the environment and climate action, the LIFE Programme is the primary financial engine for marine conservation in the Black Sea. While EMFAF funds the economic side of fisheries, LIFE focuses strictly on ecological preservation.

- **Nature and biodiversity:** LIFE directly funds the monitoring and active management of Romania's marine Natura 2000 sites. It finances critical interventions to protect endangered marine biodiversity, such as restoring sturgeon migration routes in the Danube estuary and reducing the accidental bycatch of Black Sea cetaceans (dolphins and porpoises).
- **Climate adaptation:** The program also supports coastal municipalities in the Dobrogea region and the Danube Delta in implementing nature-based solutions, helping them adapt to the physical realities of climate change, such as intensifying storm surges and coastal salinity intrusion.

The EU Innovation Fund

Funded entirely by revenues generated from the EU Emissions Trading System (EU ETS), the Innovation Fund is one of the world's largest funding programs for the demonstration of highly innovative, low-carbon technologies.

- **Heavy industry decarbonization:** This fund targets the most capital-intensive, hard-to-abate sectors of the blue economy. It is the ideal mechanism for funding the massive capital expenditure (CAPEX) required for utility-scale offshore wind farms in the Romanian exclusive economic zone (EEZ).
- **Green ports:** It also provides the capital needed to transform traditional ports into green energy hubs, funding demonstration projects for commercial-scale green hydrogen production, carbon capture and storage (CCS) beneath the seabed, and the manufacturing of synthetic maritime fuels in Constanța.

Interreg Danube Region Programme 2021–2027

While the Interreg NEXT program focuses strictly on the Black Sea basin, the Danube Region Programme addresses the "source-to-sea" connection, which is vital given that the Danube River's discharge fundamentally dictates the Black Sea's ecological health. Romania is a pivotal player in this €215 million fund.

- **Fluvial blue economy:** Under its priority for a "Greener, low-carbon Danube Region," the program finances the sustainable modernization of inland waterway transport, sediment management, and transnational flood risk prevention.
- **Pollution interception:** It funds consortiums (like the Microdrink project and others) that develop strategic guidelines and technological interventions to intercept microplastics, agricultural runoff, and industrial pollutants along the river corridor before they can accumulate in the Danube Delta and the Black Sea.

Digital Europe Programme (DEP)

The modern blue economy is entirely data-driven, and the Digital Europe Programme finances the massive digital infrastructure required to make sense of ocean data. It works in tandem with Horizon Europe to build the European Digital Twin of the Ocean (EDTO).

- **Supercomputing and AI:** DEP provides the funding for high-performance computing and artificial intelligence integration. For Romanian research hubs like NIMRD or GeoEcoMar, DEP-funded infrastructure allows them to plug their local Black Sea monitoring data into the continent-wide EDTO.
- **Predictive modelling:** This digital infrastructure enables authorities to run highly complex simulations—such as predicting the exact trajectory of an oil spill off the coast of Constanța or modeling how rising temperatures will shift commercial fish stocks—without having to build the computing architecture from scratch nationally.

Horizon Europe: Deep-Water Energy (The BLOW Project)

While the EU Innovation Fund targets commercial-scale deployments, Horizon Europe finances the bleeding-edge technology needed to make offshore energy viable in challenging environments. A significant portion of the Black Sea is too deep for conventional fixed-bottom wind turbines, requiring advanced floating solutions.

- **The BLOW project (Black sea fLoating Offshore Wind):** Backed by millions in EU grants, this ongoing Horizon project directly involves Romanian industry and academia (including GSP Offshore and the Constanța Maritime University). The consortium is developing and testing a 5-megawatt floating turbine demonstrator optimized for the specific wind speeds and deep-water hydrodynamic conditions of the Black Sea. This EU funding effectively de-risks the technology, paving the way for mass industrial production of floating wind farms off the Romanian coast.

Private funding instruments

Public grants and European funds are excellent for derisking research and building baseline infrastructure, but they cannot finance the full commercialization of the blue economy on their own. To reach the scale required for an industrial and ecological transition, Romania is increasingly relying on private capital—ranging from specialized commercial bank loans to multi-billion-euro corporate investments and venture capital.

Commercial "Blue Loans" and Green Banking

The most direct injection of private capital into the everyday blue economy comes from commercial banks offering targeted sustainability loans to micro, small, and medium enterprises (MSMEs).

- **The IFC and Banca Transilvania Blueprint:** In a landmark move for the region, the International Finance Corporation (IFC) provided a **€100 million "Blue Loan"** to Banca Transilvania. This was the first dedicated blue financing facility in Central and Eastern Europe. Banca Transilvania uses this private capital pool to issue loans specifically for water-centric projects: helping coastal hotels upgrade to sustainable water systems, financing agricultural irrigation that prevents river depletion, and funding advanced wastewater treatment for manufacturing plants.
- **EBRD Green Economy Financing Facility (GEFF):** Working through local commercial banks (like BCR and BRD), the GEFF leverages private institutional capital to fund green transitions. For coastal and fluvial businesses, this means accessible private loans to upgrade fleet engines to low-emission alternatives or install solar power on aquaculture processing plants.

Corporate Capital and Heavy Industry (Energy Giants)

When it comes to offshore energy, the capital expenditure required is so vast that it relies primarily on the balance sheets of massive private and semi-private energy corporations.

- **Offshore subsea infrastructure:** The €4.7 billion development of the **Neptun Deep** gas field is financed by OMV Petrom (alongside state-owned Romgaz). While this is a fossil fuel project, the injection of private corporate capital is what physically builds Romania's offshore supply chain. It funds the private deployment of subsea flowlines, offshore construction vessels, and local engineering expertise—the exact same private supply chain that will be pivoted to build offshore wind farms in the next decade.
- **Future offshore wind developers:** Following Romania's 2024 Offshore Wind Law, the actual construction of the planned 3 to 7 GW of wind capacity will not be paid for by the state. Instead, it will be financed by global private energy developers (like RWE, Iberdrola, or local private consortiums) who will bid for concessions and bring billions in private equity and corporate debt to build the turbines.

Venture Capital (VC) and Private Equity

For deep-tech marine startups and innovators, traditional bank loans are often too rigid. This is where venture capital steps in, bridging the gap between a lab prototype and a commercial product.

- **BlueInvest and private matchmaking:** While the BlueInvest platform is backed by the EU, its primary function is to act as a matchmaker between Romanian blue-tech startups and private European venture capital firms. If a Romanian startup designs a new autonomous underwater drone for inspecting submerged cables or a novel algae-based bioplastic, BlueInvest connects them with private equity funds dedicated to impact investing.
- **Regional Green Tech VCs:** Domestic venture capital funds in Romania (such as Early Game Ventures or Actis) are increasingly pivoting toward "climate tech." They provide the private seed funding necessary for local startups developing software for green port logistics, digital twin modeling for the Black Sea, or IoT sensors for smart aquaculture.

Stakeholder consultation results

The blue economy represents a critical pathway for sustainable growth, environmental resilience, and regional cooperation, particularly within the Black Sea basin. This chapter presents a comprehensive analysis of the targeted questionnaire conducted as part of the BlueDial project, an initiative supported and funded by the Interreg NEXT Black Sea Basin Programme.

The overarching mission is to systematically map and analyze the institutional, legal, and strategic frameworks, alongside the funding instruments, that currently support the blue economy and the Common Maritime Agenda (CMA) in the Black Sea region.

Within this broader regional scope, this chapter focuses specifically on the Romanian context. By gathering direct insights from key local and national stakeholders, this survey serves as a vital diagnostic tool. The primary objectives of this analysis are to:

- Evaluate the current potential of Romania's maritime and coastal economic sectors.
- Identify existing gaps within the legal, strategic, and institutional frameworks.
- Highlight actionable areas for improvement in national Blue Economy policies to better align with regional partner countries.

A total of 11 valid responses were recorded. In terms of type of the organisations, was a strong representation from the public and governmental sectors, with limited input from the private sector and civil society (figure 5).

- National Government / Ministry: 5 respondents (45.5%).
- Academia / Research Institution: 2 respondents (18.2%)
- Regional / Local Authority: 2 respondents (18.2%) — *Note: This combines the "Regional;Local Authority" and "Regional" entries.*
- NGO / Civil Society: 1 respondent (9.1%)
- Private Enterprise / Business: 1 respondent (9.1%).

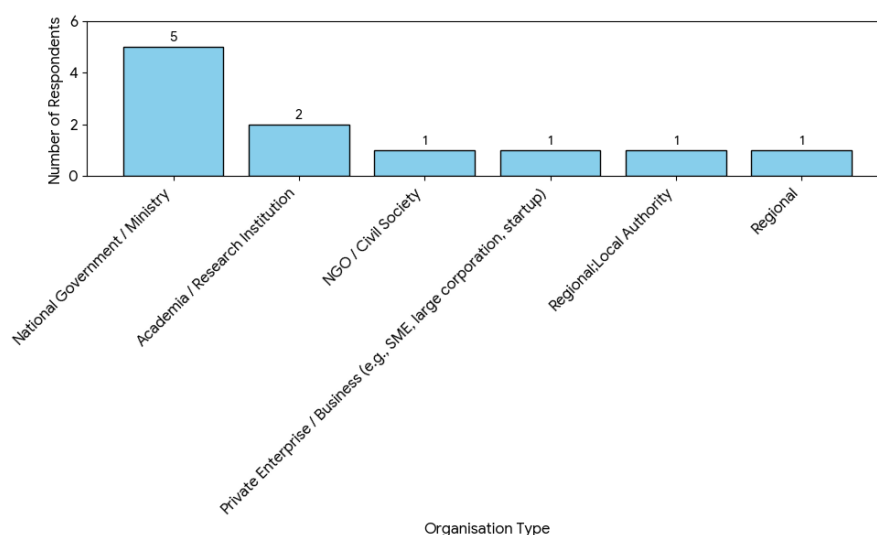


Figure 5 - Organisation type

To establish a baseline of the stakeholders' operational focus, question 5 asked respondents to identify the primary blue economy sectors their organizations directly engage with. Because respondents were permitted to select multiple sectors, the resulting data illustrates the interconnected, cross-sectoral nature of maritime and coastal activities in Romania (figure 6).

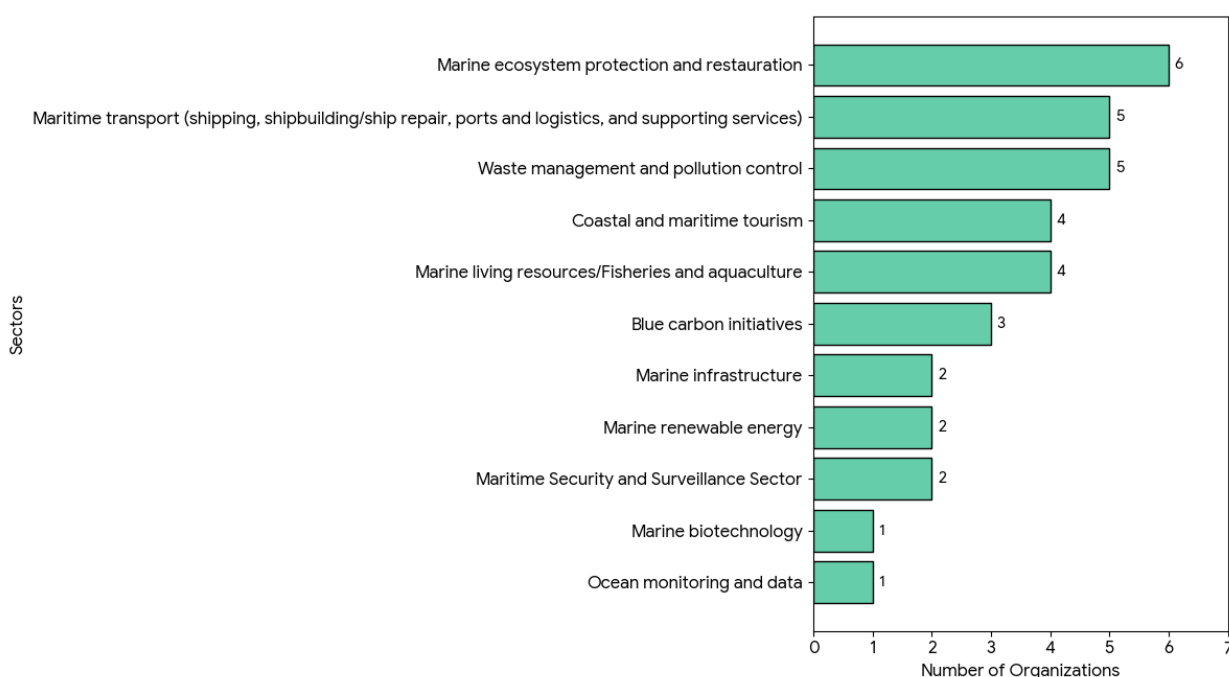


Figure 6 - Primary blue economy sectors (Q5)

The distribution of sector engagement reveals a distinct national prioritization toward environmental resilience and essential maritime operations. Out of the aggregated responses, the three most active sectors are:

1. **Marine Ecosystem Protection and Restoration (6 engagements):** This ranks as the highest area of focus, reflecting Romania's strong alignment with EU environmental directives (such as the Marine Strategy Framework Directive) and regional conservation efforts in the Black Sea and Danube Delta.
2. **Maritime Transport and Logistics (5 engagements):** Encompassing shipping, shipbuilding, and port operations, this sector's prominence highlights the strategic and economic importance of Romania's navigable waterways and coastal ports.
3. **Waste Management and Pollution Control (5 engagements):** Tying for second, the focus on pollution control further reinforces the environmental priority, particularly concerning vessel-sourced pollution and agricultural runoff.

Conversely, highly specialized and emerging sectors—such as **Marine Biotechnology** and **Ocean Monitoring and Data**—recorded the lowest levels of engagement (1 mention each). This suggests that while traditional infrastructure and conservation are well-supported, advanced technological and research-driven sectors remain largely untapped or underrepresented in the current stakeholder landscape.

Section 2 of the questionnaire shifts the focus from organizational profiles to macro-level evaluations of Romania's Blue Economy governance. It assesses the maturity of national strategies, their alignment with regional frameworks (specifically the Common Maritime Agenda for the Black Sea), and the effectiveness of cross-institutional coordination.

Respondents were asked to rate the maturity of Romania's national strategic framework for the blue economy on a scale of 1 (Non-existent) to 5 (Highly developed and integrated). The overarching sentiment is one of moderate development. The vast majority of respondents (70%) assigned a score of **3**, indicating that while foundational strategies exist, they are not yet fully integrated or optimally functional. According to the open-ended responses, this moderate score is driven by a stark contrast between strong environmental compliance (accelerated by EU

directives like the Marine Strategy Framework Directive) and a lack of mechanisms to stimulate private economic innovation. Furthermore, complex administrative workflows and heavy bureaucracy frequently delay project implementation.

Romania's blue economy legal and strategic framework is comprehensive but highly fragmented, operating under a complex web of sectoral regulations rather than a unified national policy. The framework is fundamentally anchored in European compliance mandates, driven heavily by Maritime Spatial Planning (Law No. 88/2017) and the Integrated Coastal Zone Management (ICZM) strategy to protect fragile marine ecosystems, alongside rigid transport laws like the General Transport Master Plan and Government Ordinances governing inland and maritime shipping.

At the regional and local level, strategic execution relies on highly localized, ecosystem-specific instruments, such as the Integrated Sustainable Development Strategy of the Danube Delta (SIDDDD - Horizon 2040) and the multiannual strategic plans for aquaculture and fisheries. While these overlapping documents successfully funnel key European funds (such as the CMA and PNRR) into infrastructure and environmental conservation, their division across separate transport, environmental, and agricultural authorities reinforces the institutional "silo effect" that complicates long-term governance.

Respondents evaluated how well Romania's national strategies align with the three core goals of the Black Sea CMA, rating them on a scale of 1 (Low) to 5 (Strong) (figure 7).

The quantitative data reveals a clear hierarchy in how national policies prioritize the CMA pillars:

- **Goal 1: Healthy Marine and Coastal Ecosystems (Strongest Alignment):** This goal received the highest ratings, predominantly scoring 4s and 5s. Qualitative data reveals this is due to Romania's strict adherence to EU environmental directives and robust state control inspections to prevent vessel-sourced pollution.
- **Goal 2: A Competitive, Innovative, and Sustainable Blue Economy (Moderate Alignment):** Responses skewed slightly lower (clustering at 3 and 4). Respondents noted that while traditional transport logistics are strong, innovative sectors like marine aquaculture and offshore wind are still in their infancy due to a lag in specialized national legislation.
- **Goal 3: Fostering Investment in the Blue Economy (Lowest Alignment):** This area showed the most variance, with several scores dipping to 2 and 3. Stakeholders highlighted a significant gap in modern "Blue Finance" instruments and public-private partnerships. Geopolitical risks in the Black Sea were repeatedly cited as a massive barrier hindering private investment.

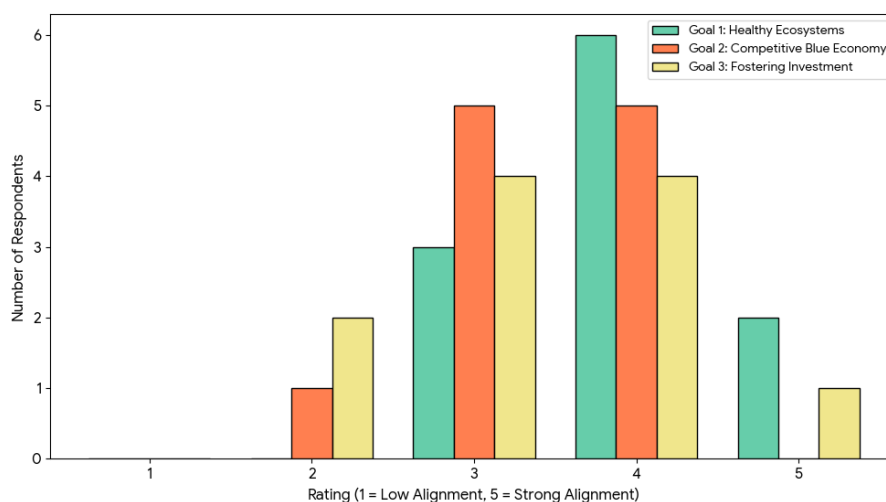


Figure 7 - Alignment with CMA goals

Based on the data for Question 10, which assessed stakeholders' familiarity with relevant EU strategies, the findings reveal a strong regional and sustainability-driven awareness among Romanian respondents. The most universally recognized frameworks are the *Common Maritime Agenda for the Black Sea* and the *EU Sustainable Blue Economy Strategy* (each cited by 8 respondents), closely followed by the *Maritime Spatial Planning Directive* and the *EU Strategic Approach to the Black Sea Region* (6 mentions each). Conversely, specialized and industry-oriented frameworks—such as the *EU Ports Strategy* (3 mentions) and the *EU Industrial Maritime Strategy* (2 mentions)—are the least familiar. This disparity in awareness further reinforces earlier findings that Romania's Blue Economy governance currently leans heavily toward environmental regulation and macro-level regional cooperation, while targeted industrial and commercial policies remain less integrated.

The qualitative responses for the critical legal and regulatory gaps reveal that the primary barrier to Romania's blue economy is not an absence of legislation, but rather severe institutional fragmentation and complex administrative procedures. Stakeholders consistently highlighted a lack of integrated coordination, noting that management is divided among multiple ministries (such as Transport and Environment) with overlapping jurisdictions and parallel sectoral laws. This friction directly delays critical infrastructure and modernization projects by creating long timelines for environmental permitting and creating conflicts regarding territorial competence—such as balancing maritime transport routes with offshore energy exploitation zones and Natura 2000 protected areas. Furthermore, respondents pointed to weak enforcement of existing laws, insufficient monitoring, a lack of specialized tools and expertise to execute policies, and a failure to engage in genuine consultations with local communities affected by environmental restrictions. Ultimately, the consensus is that while the strategic intent exists on paper, a dedicated, unified blue economy law or cross-sectoral platform is urgently needed to reduce bureaucratic burdens and enable practical implementation.

A robust blue economy requires seamless cooperation across various government bodies. Question 12 assessed the state of institutional coordination (figure 8).

- **The "Silo Effect":** A significant majority of respondents (8 out of 11) described the coordination between national institutions as **"Adequate (Functional, but siloed)."** Only one respondent viewed the synergy as "Excellent," while two categorized it as "Poor" due to overlapping responsibilities.
- **Underlying gaps:** Synthesizing this with earlier qualitative inputs, it is evident that Blue Economy policies are highly fragmented across multiple ministries (Environment, Transport, Agriculture/Fisheries, Economy). This fragmentation results in conflicting administrative workflows, particularly when developers attempt to balance rigid environmental conservation mandates with urgent infrastructure development needs.

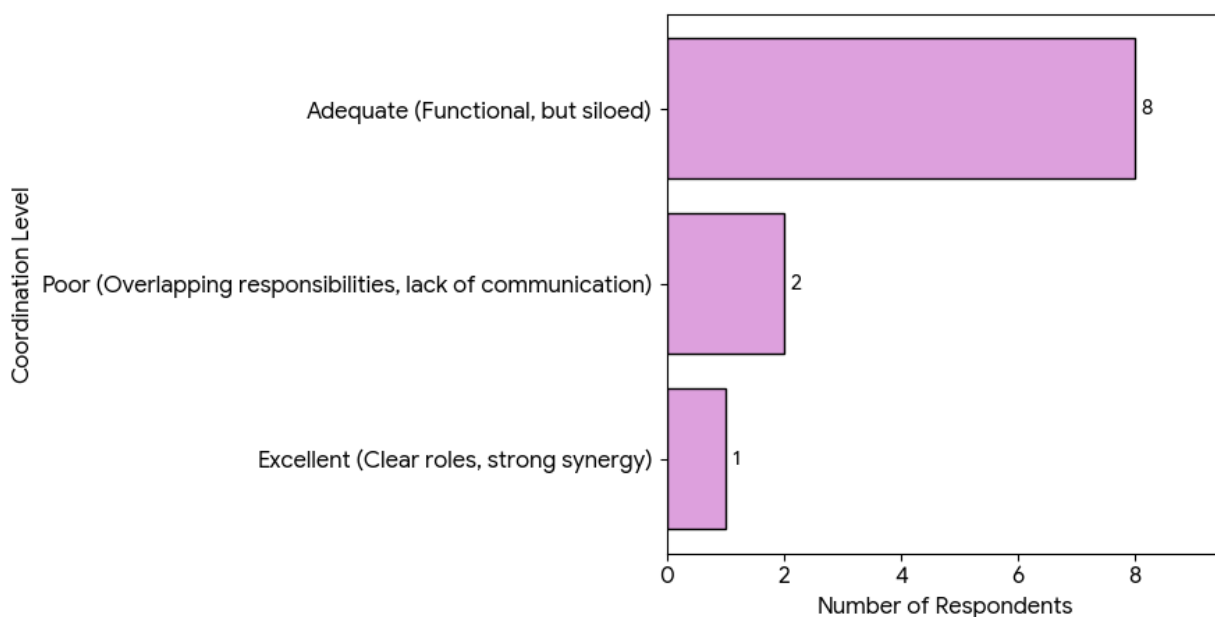


Figure 8 - Coordination between different national institutions (Q12)

While the national strategic framework sets the goals for Romania's blue economy, local execution and regional collaboration dictate the actual pace of development. Questions 13 and 14 assess the operational hurdles stakeholders face on the ground and their capacity to cooperate across borders in the Black Sea region (figure 9).



Figure 9 - Main institutional bottlenecks (Q13)

Respondents were asked to select the primary institutional bottlenecks hindering the local implementation of blue economy policies (Select all that apply).

The data highlights a compounding effect of financial and administrative constraints:

- Funding and financial constraints (9 selections): Overwhelmingly identified as the primary barrier, indicating that while high-level EU funds exist, accessing or distributing them at the local execution level remains highly problematic.

- Lack of coordination/communication between agencies (7 selections): This directly echoes the "silo effect" identified in Question 12. Local implementation is frequently stalled by poor horizontal communication between the disparate ministries governing the maritime space.
- Data limitations and lack of monitoring tools (6 selections): A significant operational gap. Without robust, shared data platforms, enforcing environmental laws or planning sustainable economic use becomes highly inefficient.
- Legal overlaps / human capacity gaps (5 selections each): Jurisdictional conflicts (e.g., transport vs. environment) and a lack of technical expertise to navigate complex administrative procedures round out the top structural barriers.

In terms of strength of transnational cooperation in the Black Sea (question 14), Respondents rated their organization's transnational cooperation on a scale of 1 (Very Weak) to 5 (Highly Integrated). The responses show a polarized landscape. The majority of respondents (5 out of 11) rated their cooperation as moderately developed (Score: 3). However, a significant subset (3 respondents) rated it as "Highly Integrated" (Score: 5), indicating that while baseline cooperation is average, certain organizations are heavily engaged in successful cross-border initiatives.

Successful transnational collaboration in the Black Sea region is heavily driven by large-scale scientific research, data sharing, and cross-border infrastructure initiatives. Major pan-European projects like the DANUBIUS-RI Hub and the DIVE project foster advanced river-sea modeling and oceanic visualization. Furthermore, climate resilience and navigability are actively supported by flagship transport initiatives such as FAIRway Danube II and PLOTTO, alongside consistent bilateral coordination facilitated by the Interreg NEXT Black Sea Programme.

Despite these advancements, long-term regional cooperation is severely hindered by the volatile geopolitical conflict and military insecurity in the northern Black Sea basin. This ongoing instability restricts critical hydrographic monitoring, creates financial uncertainty, and destroys the predictability required for sustainable institutional partnerships. Additionally, joint efforts are frequently slowed by uneven institutional capacities, as differing levels of administrative efficiency, procedural speeds, and access to funding among participating countries ultimately dictate the pace and scale of any collaborative progress.

Section 4 evaluates the financial mechanisms that sustain Romania's blue economy, analyzing the primary sources of funding, their accessibility, and the most significant barriers to securing investment.

The funding landscape in Romania is highly dependent on dedicated European Union mechanisms. The most heavily utilized instruments are:

- EMFAF (European Maritime, Fisheries and Aquaculture Fund): 7 mentions.
- Horizon Europe (including the Mission Restore our Ocean and Waters / SBEP): 7 mentions.
- Interreg Next Black Sea Programme: 6 mentions.

Notably, National or Local Grants and EU Investment Instruments (e.g., InvestEU) received fewer mentions (4 each), suggesting that while research (Horizon) and sectoral development (EMFAF) are well-funded by the EU, direct national investment and broader commercial investment instruments are lagging.

Respondents rated the accessibility of these funding instruments on a scale from 1 (Very Difficult to Access) to 5 (Very Accessible).

The responses show a relatively even but cautious spread. Most respondents clustered between 2 (Difficult) and 4 (Accessible), with no respondents finding the funds "Very Accessible" (Score: 5) and only one finding them "Very Difficult" (Score: 1).

When asked to specify the barriers to accessing these funds, respondents provided clear consensus:

- **Complex bureaucracy:** This was the most frequently cited barrier. Preparing compliant applications—especially feasibility studies that must meet both EU climate-proofing standards and complex multi-sector environmental regulations—places a massive administrative burden on operational teams.
- **Lack of co-financing:** Respondents noted that grants often require matching funds. Ongoing national fiscal tightening and state budget deficits severely limit the capacity of both public sub-agencies and SMEs to secure this required co-financing.
- **Lack of awareness and expertise:** Particularly for SMEs, there is a lack of awareness regarding available opportunities and a shortage of technical expertise necessary for project preparation.

When asked which sectors experience the greatest lack of adequate funding, the open-ended responses were diverse but pointed to a need for foundational modernization:

- **Transport and port modernization:** The greening of maritime transport, the deployment of alternative fuel infrastructure, and the urgent need for critical maintenance dredging to secure navigable inland waterways.
- **Fisheries and aquaculture support:** The need for modern landing points, zero-carbon local processing facilities, and integrated ecotourism to support locals affected by environmental restrictions.
- **Emerging sectors:** Significant gaps were noted in marine renewable energy, blue innovation/digitalization, and the integration of AI/Earth Observation technologies.

A robust blue economy relies entirely on a workforce capable of navigating the complex intersections of traditional maritime operations, environmental sustainability, and modern digital technologies. Section 5 evaluates the current availability of specialized "Blue Skills" in Romania and maps the areas of greatest untapped potential.

Further, respondents selected and ranked the top three barriers hindering the overall growth of the blue economy from a business perspective (Q18) (figure 10).

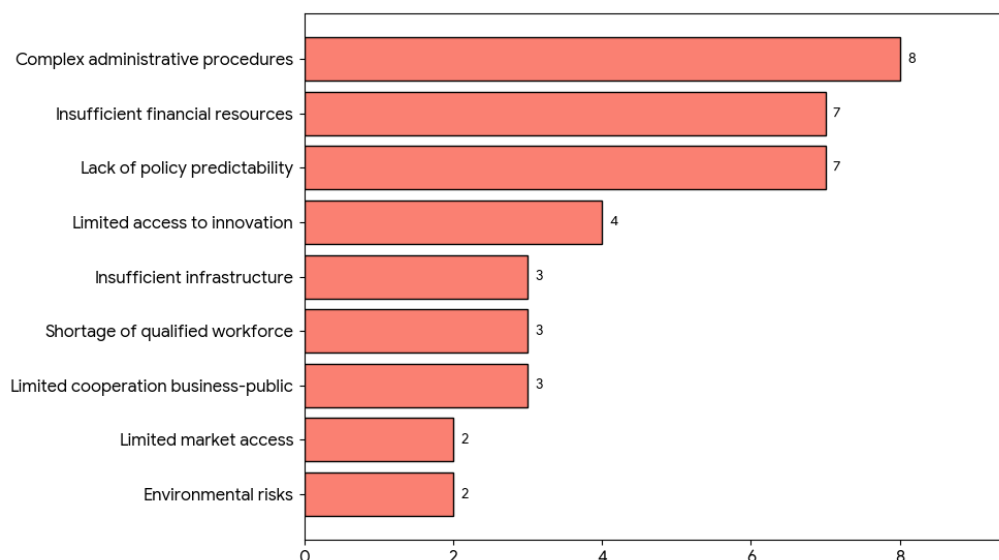


Figure 10 - Primary business barriers hindering growth (Q18)

The data reinforces the findings from previous sections, painting a picture of an environment constrained by systemic administrative issues rather than a lack of market potential.

1. **Complex administrative or regulatory procedures (8 selections):** The overwhelming top barrier. The overlapping jurisdictions and slow permitting processes actively discourage business growth.

2. Insufficient financial resources or investment (7 selections): Tying for second, this reflects the lack of modern "Blue Finance" mechanisms and the heavy reliance on complex EU grants.
3. Lack of long-term policy predictability (7 selections): Also tying for second, this barrier is heavily influenced by both the fragmented national governance structure and the volatile geopolitical situation in the Black Sea region.
4. Limited access to innovation and technology (4 selections): Following the top three, indicating a gap in transitioning traditional maritime sectors into the modern, digitized Blue Economy.

Q19 rated the availability of specialized competencies in their country on a scale from 1 (Very Insufficient) to 5 (Very Sufficient) (figure 11).

The data reveals a stark contrast between academic capacity and practical, field-ready skills:

- Highest availability: Research and innovation (Avg. 3.64) and Maritime and engineering skills (Avg. 3.55) scored the highest. This indicates that traditional academic pipelines and historical maritime engineering sectors in Romania remain relatively stable.
- Lowest availability: Conversely, Vocational education (Avg. 2.82) and Entrepreneurial/business skills (Avg. 2.91) scored the lowest. This highlights a severe gap in grassroots, technical, and commercial competencies.

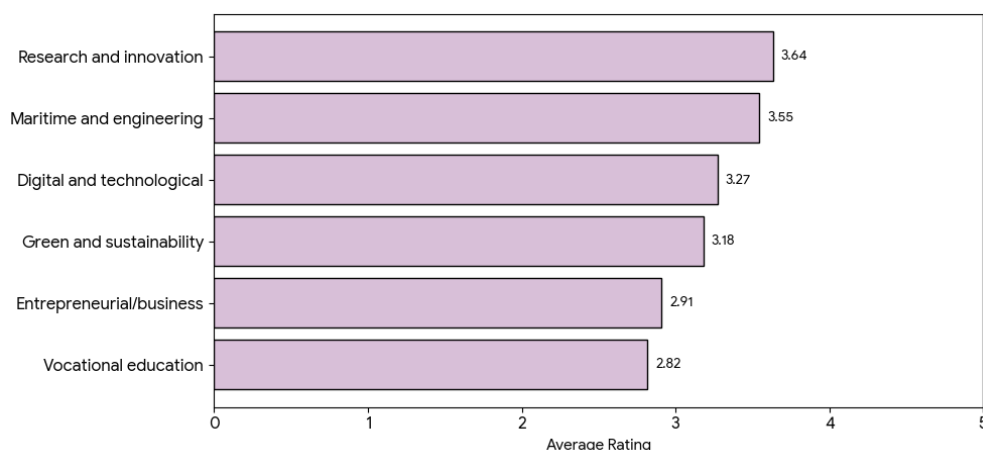


Figure 11– Availability of blue skills (Q19)

In the open-ended responses, stakeholders provided granular details on these gaps and the necessary interventions (figure 12):

- The demographic crisis: Respondents noted an acute demographic decline and youth outmigration, resulting in an aging workforce. Without clear demographic support policies, the local private sector is struggling to find human resources.
- The technical disconnect: Vocational education is heavily disconnected from the modern blue economy. There is an urgent need to revitalize trade schools via direct partnerships with local businesses to ensure curricula match current market demands.
- Specific shortages: Significant gaps exist for technical crew members (e.g., for dredging vessels), river hydrology experts, and IT specialists for vessel traffic management. Furthermore, there is an acute need for "green skills"—such as managing low-emission ships and alternative propulsion systems—and advanced cybersecurity skills for automated port environments.
- Solutions: Respondents repeatedly called for funded digital reskilling programs, direct industry-academia cooperation (e.g., subsidized internships via universities like Dunărea

de Jos in Galați), targeted vocational training, and financial incentives to retain young maritime officers.

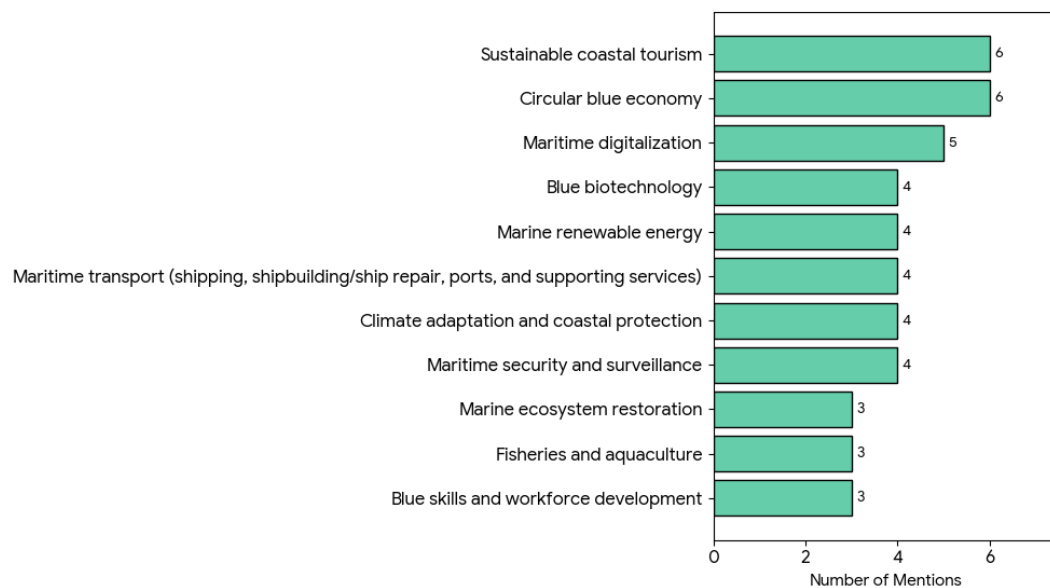


Figure 12 - Greatest untapped potentials (Q20)

The final section of the survey synthesizes the specific challenges faced at the regional (subnational) level and gathers direct policy recommendations from the stakeholders to improve the broader Blue Economy ecosystem in Romania.

Looking toward the future, respondents selected the sectors they believe hold the greatest untapped potential for Romania and the wider Black Sea region.

The responses illustrate a desire to pivot from traditional, heavily regulated infrastructure toward sustainable, modern economic models:

- **Tourism and circularity:** The top two areas of potential are Sustainable Coastal Tourism and the Circular Blue Economy (6 mentions each). This aligns with the earlier calls for integrated ecotourism and green local processing.
- **Digitalization and innovation:** Maritime Digitalization (5 mentions) and Blue Biotechnology (4 mentions) rank highly, reinforcing the sentiment that Romania is currently lagging in technological integration and could experience massive growth if these sectors are unlocked.
- **Energy and adaptation:** Marine Renewable Energy and Climate Adaptation and Coastal Protection (4 mentions each) also show strong potential, reflecting the urgent need to address the impacts of climate change on the Black Sea coast and Danube Delta.
- **"Other" mentions:** One respondent specifically highlighted the potential for developing innovative models of *restorative aquaculture* and the *superior, ecological valorization of biomass*.

Respondents identified the most significant challenges hindering the development of the blue economy specifically at the local/regional level (Q22) (figure 13).

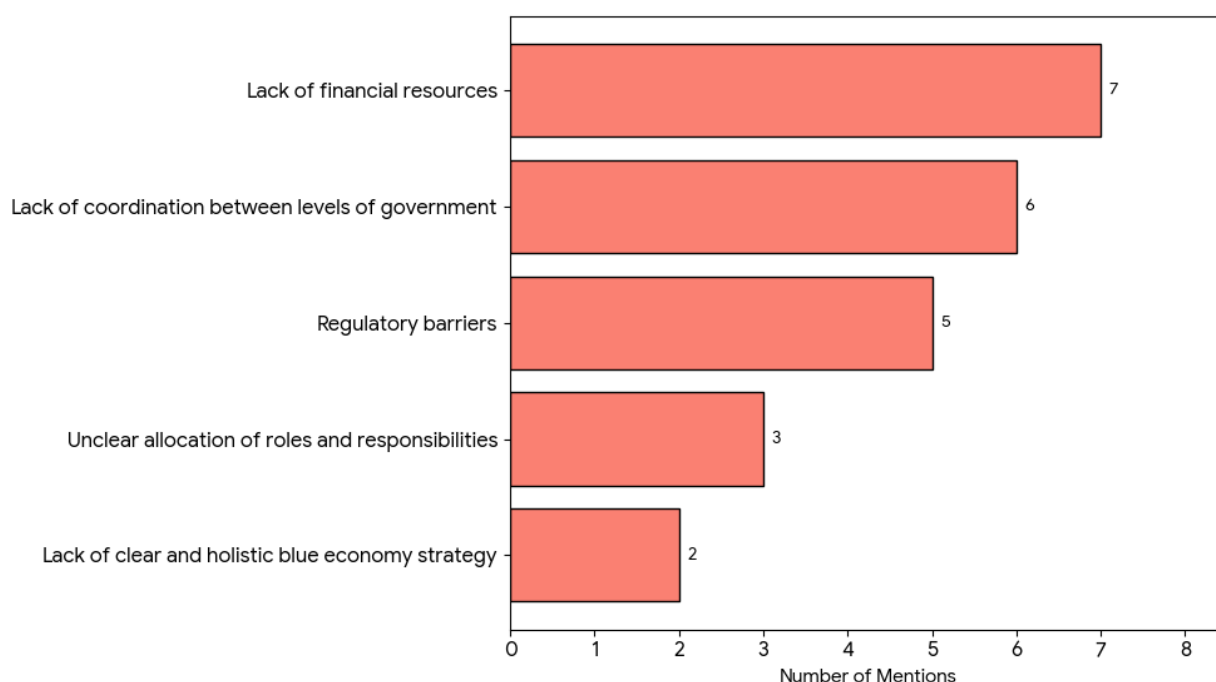


Figure 13 - Top 5 national challenges (Q22)

The findings at the subnational level mirror the macro-level issues identified earlier in the survey, but with a heightened emphasis on execution:

- Lack of financial resources (7 mentions): The inability of local communities and regional agencies to secure necessary funding remains the absolute highest barrier.
- Lack of coordination between levels of government (6 mentions): A critical issue. Local actors feel disconnected from national policy directives, pointing to a breakdown in vertical governance.
- Regulatory barriers (5 mentions): Rigid top-down rules that do not account for local realities.
- Unclear allocation of roles and responsibilities (3 mentions): Creating administrative confusion at the county and municipal levels.

To counter these challenges, respondents selected their top priority actions (Q23). The priorities clearly focus on practical, resource-driven solutions:

- Channel public and private funds (6 mentions): Directing capital precisely where it is needed locally.
- Boost technology use and uptake (5 mentions): Modernizing local maritime infrastructure and SME operations.
- Improve the regulatory environment and set up a formal strategy (4 mentions each): Calling for localized, actionable blueprints rather than generic national decrees.

The survey concluded by asking respondents for ONE major policy change (Q21) and allowing them to highlight any uncovered local nuances (Q24). The qualitative responses provide the most direct, actionable insights:

- Establish an integrated governance mechanism Multiple respondents called for the creation of a centralized authority. Specifically, one respondent recommended: *"Establish an integrated, National inter-ministerial Task Force for the Blue Economy that bridges the Ministry of Transport, the Ministry of Environment, and the Ministry of Energy."* Another called for establishing *"one single authority for the blue economy"* to eliminate the parallel sectoral legislation currently causing friction.

- Shift to a "Bottom-Up" regulatory approach A recurring theme is the need to empower local actors. One respondent noted that a sustainable blue economy only works if regulations are flexible and adapted locally. They stated that the central administration must become a "facilitator," validating solutions that come directly from the "grassroots" through consultation with local populations, associations, and local governments.
- Decouple critical infrastructure from annual bureaucracy For operational bodies like the River Administration, the recommendation is highly specific: *"The establishment of a Simplified, Multi-Annual Funding Mechanism for Maintenance Dredging... Decoupling dredging budgets from annual bureaucratic fiscal cycles would allow AFDJ Galați to act proactively at known critical bottlenecks."*
- Acknowledge geopolitical and climate realities In the final nuances, stakeholders urged that the report must explicitly address two unavoidable realities:
- The security trilemma: The physical hazards in the western Black Sea (mines, restricted zones) directly impact navigation safety, increase insurance premiums, and bottleneck new projects, demanding adaptive crisis-management frameworks.
- Permanent climate shifts: Extended summer droughts on the Danube are no longer anomalies but a "permanent seasonal norm," severely impacting fairway availability. The Danube must be treated as a critical European Highway requiring proactive resilience planning, rather than reactive crisis management.

In conclusion, this analysis of the blue economy in Romania highlights a landscape of significant untapped potential currently constrained by structural governance challenges rather than a lack of strategic intent. While Romania demonstrates strong adherence to European environmental directives and has established a solid baseline through strategies like the Maritime Spatial Planning Law and the Danube Delta's Integrated Development Strategy, the actual operational environment remains heavily siloed. Institutional fragmentation across transport, environment, and energy ministries creates a complex web of administrative bottlenecks that prioritize compliance over commercial innovation and private-sector agility.

Moving forward, the evidence points to a clear need for a more integrated, "bottom-up" governance model that moves beyond generic national policies toward actionable, localized strategies. Accelerating the growth of the Romanian blue economy will require simplifying bureaucratic access to funding—specifically by decoupling critical infrastructure maintenance from rigid annual fiscal cycles—and fostering robust industry-academia cooperation to close the acute "blue skills" gap. By addressing these structural impediments and harmonizing sectoral authorities, Romania can better leverage its unique maritime and fluvial advantages to transition toward a competitive, sustainable, and technologically resilient blue economy.

Potentials and Gaps (SWOT Analysis)

The following SWOT analysis synthesizes the current state of Romania's blue economy. It evaluates internal capacities—such as institutional framework and industrial heritage—against external drivers, including geopolitical shifts, EU funding mandates, and climate change.

SWOT matrix

Table 3 – SWOT matrix

STRENGTHS (Internal)			WEAKNESSES (Internal)
Industrial infrastructure	Foundation: (Port of	Established (Constanța) and	Institutional Fragmentation: Overlapping jurisdiction across ministries leading to "siloed" governance.

competitive high-tech shipbuilding (Vard Tulcea).	
Scientific Expertise: Robust network of marine research institutes (NIMRD, GeoEcoMar) and maritime universities.	Bureaucratic Bottlenecks: Complex, slow permitting processes that deter private investment.
Legal Framework: Recently adopted Maritime Spatial Plan and Offshore Wind Law.	Sectoral Vulnerability: Heavy reliance on a single invasive species (rapa whelk) for fisheries value.
Connectivity: Strategic access to the Middle Corridor and Danube-Black Sea transit routes.	Skills Gap: Demographic decline and a disconnect between vocational training and modern industry needs.

OPPORTUNITIES (External)	THREATS (External)
Offshore Renewable Energy: Massive potential (76+ GW) for wind energy to become a cornerstone of the energy mix.	Geopolitical instability: Regional volatility, drifting sea mines, and maritime security threats.
EU Green Deal/Funding: Access to extensive "Blue Finance" via Horizon Europe, EMFAF, and PNRR.	Climate Change: Accelerating coastal erosion and drought-driven navigability issues on the Danube.
Blue Innovation: Growth potential in biotechnology, blue carbon sequestration, and digital ocean twins.	Market Competition: Regional competition from other Black Sea and Mediterranean ports/resorts.
Eco-Tourism Diversification: Transitioning from seasonal mass tourism to high-value, year-round heritage and wellness models.	Regulatory Lag: Risk that legislative speed fails to keep pace with rapid technological change (e.g., AI, floating wind).
Expanding sustainable offshore mariculture	Ecosystem shifts and proliferations of invasive species

Strategic synthesis

Romania's primary comparative advantage lies in the synergy between its industrial core and its research base. The current strength in shipbuilding (e.g., Vard Tulcea) is not merely a legacy sector; it is a critical asset for the opportunity of offshore wind construction. By bridging the gap between national shipyards and the research capabilities of universities like Constanța Maritime University, Romania can position itself as a primary supply-chain hub for the Black Sea offshore energy transition.

The most significant *weakness*—institutional fragmentation—prevents the country from fully realizing its *opportunities*. The "silo effect," where the Ministry of Transport, Ministry of

Environment, and Ministry of Energy operate with limited coordination, must be addressed to unlock the potential of the Maritime Spatial Plan. Until the permitting process is unified or streamlined, Romania risks being "outpaced" by regional competitors who can offer faster timelines for green energy and infrastructure projects.

External *threats*, particularly regional instability and climate change, are "permanent norms" rather than short-term risks.

- Navigation: Security and insurance costs related to the northern Black Sea conflict remain a structural threat to the logistics sector.
- Environment: The reliance on "hard" engineering (breakwaters/nourishment) to combat coastal erosion must be supplemented by the *opportunity* of nature-based solutions (e.g., seaweed forest restoration) to create a sustainable, lower-cost buffer against the sea.

Romania has successfully navigated the transition to *compliance* (meeting EU directives). The next phase, and the greatest *opportunity*, is the transition to *commercialization*. This requires moving away from a "grant-based" economy where projects survive only through public funding, and toward a "bankable" economy that attracts private equity, venture capital, and institutional investors to the Romanian coastline.

Conclusions and recommendations

The BlueDial State of the Art report for Romania has provided a granular diagnostic of the nation's blue economy. By bridging institutional mapping, strategic legislative reviews, and stakeholder consultations, the findings confirm that while Romania possesses the fundamental assets and legislative baseline to become a regional leader, the transition remains hindered by systemic administrative inertia and structural fragmentation.

Conclusions

As of 2026, the Romanian blue economy stands at a critical juncture defined by both significant potential and systemic hurdles. Despite having robust sectoral legislation, such as the Maritime Spatial Plan and recent offshore wind laws, governance remains fragmented across several line ministries. This "silo effect" creates administrative bottlenecks that discourage private investment and delay urgent infrastructure projects. While Romania has made significant strides in aligning with the European Green Deal, the shift from traditional extractive activities toward "blue innovation"—such as offshore wind energy, marine biotechnology, and sustainable aquaculture—is technically viable but currently lacks a cohesive, accelerated deployment strategy.

Furthermore, while European funding mechanisms like EMFAF, PNRR, and Horizon Europe serve as the sector's lifeblood, this reliance has masked a critical absence of private, bankable "blue finance." The private sector is eager to innovate, but it remains hampered by the perceived risks associated with the Black Sea region and a lack of clear venture capital pathways. Finally, the regional security climate and the accelerating impacts of climate change, specifically coastal erosion and riverine droughts, must now be viewed as "permanent norms" rather than anomalies. Consequently, the current reactive management style must evolve into proactive, systemic resilience planning to safeguard the long-term viability of the maritime sector.

Recommendations

To translate these conclusions into actionable growth, the following strategic recommendations are proposed for national authorities, regional bodies, and the private sector.

Policy Improvements and Institutional Strengthening

To address governance fragmentation, Romania should establish a unified National Blue Economy Roadmap that moves beyond sectoral strategies to harmonize the objectives of the Ministries of Environment, Transport, Energy, and Economy. This should be supported by a "Blue Innovation" fast-track, creating a regulatory sandbox for emerging sectors like marine biotech and offshore renewable energy to accelerate permitting processes, provided projects meet strict environmental criteria. To operationalize these changes, a permanent, high-level Inter-Ministerial Blue Economy Task Force should be formed, reporting to the Prime Minister's office. This body would be empowered to resolve inter-departmental conflicts regarding spatial planning, maritime security, and permitting without reverting to lower-level bureaucratic delays. Simultaneously, empowering regional and local authorities with greater autonomy to execute localized maritime strategies will ensure that the "bottom-up" needs of coastal communities—such as fisheries and tourism—are effectively integrated into national planning.

Funding Optimisation and Regional Cooperation

Strategically, the funding architecture must shift from a reliance on non-reimbursable grants to a model that leverages InvestEU guarantees and private equity. Adopting these blended finance models will help de-risk projects for commercial banks and attract venture capital into key sectors like offshore wind and marine technology. Furthermore, for critical operations such as maintenance dredging and coastal erosion protection, the government should establish multi-annual funding cycles to prevent essential infrastructure work from being stalled by the volatility of annual national budgets. Finally, to enhance Black Sea-level cooperation, Romania should leverage the Black Sea Assistance Mechanism (BSAM) to create a more active, industry-facing National Hub in Constanța. This hub should act as the primary clearinghouse for cross-border project matchmaking, while also prioritizing the integration of national marine data with the European Digital Twin of the Ocean. Standardizing data collection across the Black Sea will allow for better regional crisis management, improved security for offshore assets, and more accurate environmental impact assessments for cross-border initiatives.

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