

Interreg NEXT Black Sea Basin Programme 2021–2027
Project BlueDial — BSB01288

D1.1 Report on State of the Art

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Executive summary

The "Report on State of the Art" is a foundational deliverable within the BlueDial project (Interreg NEXT Black Sea Basin Programme 2021–2027) designed to map and evaluate the blue economy landscape across Romania, Bulgaria, Türkiye, and Georgia. By assessing existing institutional, legal, and strategic frameworks, the report supports the project's overarching objective to foster continuous public dialogue under the Common Maritime Agenda (CMA) and deliver actionable policy recommendations for coordinated regional development.

The Black Sea basin currently stands at a critical transitional juncture. While traditional maritime activities—such as maritime transport, port logistics, shipbuilding, commercial fisheries, and coastal tourism—form the economic bedrock of the littoral states, a strategic pivot is underway toward emerging, high-value domains like offshore renewable energy, blue biotechnology, and sustainable aquaculture. A targeted consultation of 60 regional stakeholders confirms this dual focus, revealing that while established transport and environmental conservation initiatives command the highest direct engagement, actors widely recognize massive untapped potential in circular economy models, digital transformation, and marine ecosystem restoration.

Despite these foundational assets, the region's transition toward an integrated and innovative blue economy is constrained by systemic structural bottlenecks. The most pervasive challenge is severe institutional fragmentation, or the "silo effect," where governance is dispersed across multiple uncoordinated line ministries, leading 56.7% of stakeholders to characterize regional institutional coordination as "Poor". This governance gap triggers a steep vertical "drop-off" in implementation at the subnational level, where local municipalities lack administrative capacity and spatial planning tools. Financially, the ecosystem is heavily reliant on EU and international funding streams—such as Horizon Europe, EMFAF, and Interreg—while suffering from a critical absence of private, bankable "blue finance," high co-financing barriers, and complex bureaucratic burdens. These challenges are further compounded by a pronounced "blue skills" deficit in digital and green transition competencies, alongside permanent structural threats stemming from regional geopolitical instability and accelerating climate change impacts like coastal erosion and riverine droughts.

To overcome these hurdles and transition from a grant-dependent model to a resilient, bankable blue economy, the report outlines a comprehensive set of strategic recommendations. Nations must elevate maritime governance by establishing unified National Blue Economy Roadmaps and permanent inter-ministerial task forces to streamline permitting and eliminate sectoral silos. Funding architectures must evolve toward blended finance models that leverage private equity and institutional guarantees to de-risk high-impact innovations. Furthermore, subnational authorities must be empowered through dedicated project preparation desks and specialized vocational training hubs, while transnational cooperation should be deepened by aligning national frameworks with CMA goals and integrating regional data into the European Digital Twin of the Ocean.

Introduction

Objective of the report

The "Report on the State of the Art" is a foundational deliverable within the BlueDial project, designed to illuminate the broader blue economy landscape across the Black Sea. By consolidating and analyzing the current maritime situations in Romania, Bulgaria, Türkiye, and Georgia, the report supports the project's overall objective: 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 these respective nations and the Black Sea Basin as a whole. Furthermore, the project acts as a vital mechanism to actively support and foster cooperation among regional and sub-national institutions throughout the entire Black Sea region.

Specifically, this consolidated reporting effort 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 across the region. It aims to identify the potentials and gaps within the current strategic and institutional frameworks of Romania, Bulgaria, Türkiye, and Georgia, while simultaneously evaluating how these national elements correlate and integrate at 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 regional 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 combines rigorous desk research on the existing strategic and institutional frameworks with insights gathered from interviews with key stakeholders across the participating nations. This collaborative approach ensures the report provides detailed, accurate information on national specifics while highlighting actionable areas for regional synergy and improvement in Black Sea blue economy policy.

Background and context

The Black Sea is a highly strategic, semi-enclosed marginal sea situated at the crossroads of Europe, Asia, and the Middle East. It is bordered by six littoral states—Bulgaria, Georgia, Romania, the Russian Federation, Türkiye, and Ukraine—and serves as a vital maritime bridge connecting the Caucasus and Central Asia to Europe. The sea connects to the Mediterranean via the Bosphorus and Dardanelles straits and to the Sea of Azov via the Kerch Strait.

Oceanographically, the Black Sea is unique. It is the world's largest meromictic basin, meaning its deep waters do not mix with the upper layers. Consequently, nearly 90% of its deep water volume is naturally anoxic (oxygen-depleted) and rich in hydrogen sulfide, restricting marine life entirely to the oxygenated upper layer (typically the top 150 to 200 meters). Its ecosystem is heavily influenced by major European river systems, particularly the Danube, Dnieper, and Don, which drain a massive catchment area spanning 23 countries and over two million square kilometers.

Because of its limited exchange with the open ocean and immense riverine input, the Black Sea is acutely vulnerable to anthropogenic pressures. Historical and ongoing challenges include:

- **Eutrophication:** Agricultural runoff and untreated wastewater from the massive drainage basin led to nutrient over-enrichment, causing algal blooms and threatening biodiversity.
- **Pollution:** Industrial pollutants, plastic waste, and maritime traffic discharges accumulate readily due to the sea's semi-enclosed nature.
- **Invasive species:** The introduction of alien species via ship ballast water (most notably the comb jelly *Mnemiopsis leidyi* in the 1980s) has historically devastated local pelagic fish stocks and disrupted the entire food web.

Despite persistent environmental and geopolitical challenges, the Black Sea possesses immense potential for a sustainable blue economy. Serving as a critical connector between Europe, the Southern Caucasus, Central Asia, and the Eastern Mediterranean, it is a vital artery for international shipping, energy transport, and trade. The states surrounding the Black Sea (excluding Russia) represent a combined population of nearly 164 million people and generate a regional Gross Domestic Product (GDP) of approximately €2 trillion.

The traditional blue economy sectors—such as coastal tourism, maritime transport, shipbuilding, and commercial fisheries—serve as significant drivers of employment and Gross Value Added (GVA) for the coastal states. However, the economic impact and structure of the blue economy vary significantly among Romania, Bulgaria, Türkiye, and Georgia:

- **Türkiye:** Possessing the longest Black Sea coastline (approximately 1,700 km, or 23% of the basin), Türkiye is a dominant force in the regional blue economy. Its strategic location supports robust maritime transport, port management, and a massive shipbuilding industry (accounting for a notable share of global new ship orders). Furthermore, Türkiye is aggressively expanding into aquaculture and offshore renewable energy.
- **Romania:** According to the EU Blue Economy Observatory (2023 data), Romania's established blue economy directly employs approximately 65,000 people, generating around €1.5 billion in GVA (accounting for about 0.6% of national GDP and 0.8% of employment). Port activities are the largest contributor to GVA (27%), driven primarily by the Port of Constanța—the ninth-largest container port in the EU, handling over 67 million tonnes of cargo annually. Other major sectors include shipbuilding (23% of GVA) and living resources (fisheries and aquaculture).
- **Bulgaria:** With a 414 km coastline (8.5% of the basin), Bulgaria's coastal regions are vital to its national economy, historically generating up to 13% of the nation's total GVA. Coastal tourism is a particularly dominant and fast-growing sector, representing the primary engine of blue jobs in the country.
- **Georgia:** While Georgia has the smallest overall economy among the four (with a GDP significantly lower than the EU average), its blue economy is highly strategic. It serves as a crucial maritime transit hub connecting the Caucasus to European markets. Port infrastructure development and fisheries are central to its national maritime strategy.

Furthermore, the basin is experiencing a strategic shift toward emerging, sustainable blue economy sectors. As highlighted by the World Bank and the EU Green Deal, there is growing investment in:

- **Offshore renewable energy:** Particularly wind and wave technologies, aimed at integrating marine energy into national climate objectives.
- **Sustainable aquaculture:** Shifting away from overexploited wild catch to structured farming, vital for regional food security.

- **Blue biotechnology and coastal resilience:** Developing nature-based solutions to combat eutrophication and protect degrading shorelines.

Unlocking this immense potential requires a delicate balance: maximizing economic exploitation—and the resulting GDP growth—while urgently addressing environmental restoration, climate adaptation, and the implementation of circular economy principles.

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. Combined with inconsistent data collection methodologies across Member States, this limits the comparability and consistency of data across sectors and countries.

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 in the Black Sea basin

The governance of the blue economy across the Black Sea basin is characterized by a highly decentralized, multi-level institutional architecture. In Romania, Bulgaria, Türkiye, and Georgia, there is no single overarching "Ministry of the Blue Economy." Instead, responsibilities are distributed across sector-specific national ministries, specialized executive agencies, and regional management authorities.

This multi-sectoral distribution reflects the complex reality of maritime activities. However, it also necessitates robust horizontal (inter-ministerial) and vertical (national-to-local) coordination to

successfully implement basin-wide initiatives like the Common Maritime Agenda (CMA) and the Bucharest Convention.

Basin-wide governance architecture

Environmental protection and marine ecosystems

Across the Black Sea basin, environmental governance is strictly regulated by dedicated ministries tasked with preserving marine biodiversity and ensuring water quality. Because the sea is semi-enclosed and highly vulnerable to anthropogenic pressures, these institutions serve as the frontline defense against pollution, eutrophication, and habitat degradation, ensuring that blue economy activities do not exceed ecological thresholds.

In the European Union member states of Romania and Bulgaria, environmental policy is deeply integrated with EU regulatory frameworks. Romania's Ministry of Environment, Waters and Forests (MMAF) and Bulgaria's Ministry of Environment and Water (MOEW) serve as the central authorities responsible for translating critical European legislation—most notably the Marine Strategy Framework Directive (MSFD) and the Water Framework Directive—into enforceable national law. Their primary objective is to achieve and maintain Good Environmental Status (GES) across their respective territorial waters and Exclusive Economic Zones. To operationalize these mandates, both ministries rely heavily on specialized regional agencies. Entities such as Romania's Dobrogea-Litoral Water Basin Administration (ABADL) and Bulgaria's Black Sea Basin Directorate in Varna act as the active regulatory arms on the coast, conducting continuous environmental monitoring, managing coastal erosion, and enforcing strict pollution controls.

Along the basin's extensive southern coast, Türkiye manages its marine environmental responsibilities through the Ministry of Environment, Urbanization and Climate Change. This ministry functions as the principal authority for mitigating marine pollution, overseeing waste management, and executing comprehensive environmental impact assessments (EIAs) for new coastal infrastructure. Furthermore, it plays a vital role in integrated coastal zone planning and climate adaptation, balancing the country's significant industrial and tourism footprint with the need for long-term ecological resilience.

On the eastern shore, Georgia utilizes a more consolidated governance model. The Ministry of Environmental Protection and Agriculture (MEPA) operates under a dual mandate, simultaneously overseeing both marine ecosystem protection and agricultural and fisheries management. This integrated structural approach allows Georgia to closely align its environmental monitoring, biodiversity conservation, and protected area management directly with the regulation of resource extraction, ensuring a cohesive approach to sustainable coastal development.

Maritime transport, ports, and logistics transport

Transport connectivity serves as a critical economic driver for the entire Black Sea region, facilitating international trade and acting as a vital logistical bridge between Europe, the Caucasus, and Asia. Across the basin, national ministries of transport—or their broader economic equivalents—act as the central regulatory and developmental bodies. They are tasked not only with expanding port capacity and enforcing maritime safety but also with adapting these essential logistics networks to meet modern decarbonization and digitalization standards.

In Romania, the Ministry of Transport and Infrastructure acts as the strategic architect for the country's maritime and inland waterway connectivity. The ministry focuses heavily on the systemic expansion of the Port of Constanța and the vital Danube-Black Sea canal networks. A primary objective is to capture the rapidly expanding freight volumes of the trans-Caspian "Middle Corridor," positioning Romania as a premier European logistics gateway. Concurrently, the ministry drives the transition toward sustainable logistics by mandating port decarbonization, green fuel adoption, and multimodal transport integration.

Similarly, Bulgaria's Ministry of Transport and Communications serves as the lead national authority for maritime transport policy. To manage its coastal logistics, the ministry operates through highly specialized executive agencies. The Executive Agency 'Maritime Administration' (EAMA) enforces maritime safety, vessel traffic monitoring, and search-and-rescue operations, while the Bulgarian Port Infrastructure Company (BPIC) manages the physical infrastructure and navigational aids at major maritime hubs like Varna and Burgas. Together, these entities ensure Bulgarian ports remain competitive and compliant with European transport network (TEN-T) standards.

Given its extensive coastline and control over the strategic straits, Türkiye manages a massive volume of maritime commerce through its Ministry of Transport and Infrastructure. This ministry provides the essential regulatory backbone for the nation's sprawling shipping industry, port development, and complex logistics corridors. Operating in tandem with specialized units like the Directorate General of Coastal Safety, the ministry ensures the safe, efficient flow of dense commercial vessel traffic while driving investments into national maritime infrastructure and international connectivity.

On the eastern shore, Georgia integrates its maritime transport governance directly into its broader macroeconomic planning. The sector operates under the overarching umbrella of the Ministry of Economy and Sustainable Development (MoESD). Because Georgia functions as a highly strategic transit node connecting landlocked Central Asian markets to the Black Sea, its ports are vital national assets. The MoESD utilizes its specialized Maritime Transport Agency to enforce shipping regulations, ensure maritime safety, and manage port-related regulatory matters, ensuring that logistics development remains seamlessly aligned with Georgia's national economic growth targets.

Fisheries and aquaculture

Food security and the sustainable exploitation of living marine resources are critically important to the Black Sea's blue economy. Across the four nations, these domains are universally governed by agricultural ministries, which are tasked with the delicate mandate of balancing commercial extraction and economic viability with the fragile biological realities of regional fish stocks.

In the European Union member states of Romania and Bulgaria, fisheries and aquaculture policies are heavily dictated by the EU Common Fisheries Policy (CFP). Romania's Ministry of Agriculture and Rural Development (MADR) and Bulgaria's Ministry of Agriculture and Food (MAF) serve as the primary institutional conduits for this framework. Both ministries heavily leverage structural funding, specifically through the European Maritime, Fisheries and Aquaculture Fund (EMFAF), to finance the sector's long-term transition. This capital is strategically directed toward modernizing aging fishing fleets, enforcing strict commercial quotas to combat illegal fishing, and actively incentivizing a shift away from overexploited wild catch toward sustainable, high-tech marine aquaculture and advanced processing.

Türkiye possesses a highly developed and expansive fisheries and aquaculture sector, which is governed by its Ministry of Agriculture and Forestry. Operating primarily through its General

Directorate of Fisheries and Aquaculture, the ministry oversees a massive volume of marine production that is vital for both domestic consumption and export. Its regulatory focus is heavily centered on establishing sustainable aquaculture production areas, protecting critical marine habitats from overexploitation, managing complex licensing systems, and providing robust structural support and oversight for regional fishermen's cooperatives and producer organizations.

In Georgia, the governance of living marine resources is fully integrated with ecological protection through the Ministry of Environmental Protection and Agriculture (MEPA). By housing fisheries regulation and environmental oversight within the exact same institutional framework, Georgia ensures that commercial resource management, aquaculture licensing, and the implementation of sustainability measures are tightly bound to national biodiversity and ecosystem conservation targets.

Coastal and maritime tourism

Coastal and maritime tourism is a historic economic engine for the Black Sea, but it is a sector currently undergoing a profound paradigm shift. Institutions across the basin are pivoting away from the traditional, high-density summer seasonal models toward sustainable, high-value, and year-round "blue tourism." This transition requires active destination management, infrastructure upgrades, and the integration of digital tools to balance economic growth with coastal preservation.

In Bulgaria and Türkiye, coastal tourism is a cornerstone of the national economy, and both states rely on dedicated entities to drive destination promotion and development. Bulgaria's Ministry of Tourism oversees the heavily developed coastline (including major resorts like Sunny Beach and Golden Sands) and manages the National Tourism Strategy. The ministry focuses on raising service standards, expanding the network of "Blue Flag" certified beaches and marinas, and integrating sustainable practices into regional development programs. Similarly, Türkiye's Ministry of Culture and Tourism acts as the central authority for its massive coastal tourism sector. It governs everything from destination promotion and accommodation classification to the strategic development of high-yield niche markets, such as yacht tourism and marina operations, ensuring that the economic influx does not exceed the carrying capacity of its coastal environments.

Romania approaches this sector through a dual-institutional framework. The Ministry of Economy, Digitalization, Entrepreneurship and Tourism (via its General Directorate for Tourism) is the primary engine for commercial coastal development. It provides the financial stimuli to upgrade HoReCa infrastructure and combat the chronic seasonality of the Dobrogea coast by promoting eco-tourism and balneotherapy. However, Romania also relies heavily on the Ministry of Culture to sustainably exploit its underwater cultural heritage. By mapping and protecting submerged archaeological sites, the Ministry of Culture enables the creation of specialized SCUBA-diving routes, diversifying the tourism portfolio and adding significant cultural value to the coastal economy.

In Georgia, tourism policy is intrinsically linked to broader economic planning. The sector is driven by the Georgian National Tourism Administration, which operates as a specialized sub-agency under the Ministry of Economy and Sustainable Development (MoESD). Georgia's approach focuses on capitalizing on its unique coastal assets—such as the therapeutic magnetic sands of Guria and the vibrant resort infrastructure of Adjara (Batumi)—while simultaneously establishing robust safety regulations for outdoor and adventure tourism. The administration is also increasingly focusing on sustainable community engagement and eco-friendly accommodations to protect its vulnerable coastal habitats and marine life from the pressures of rapid development.

Maritime Spatial Planning (MSP) and offshore energy

As the Blue Economy expands into highly industrial and emerging sectors like offshore wind energy and deep-water natural gas, spatial planning has emerged as a critical institutional function across the Black Sea. Navigating the competing demands for maritime space requires specialized regulatory mechanisms to mitigate conflicts between traditional sectors—such as shipping lanes, military training zones, and commercial fisheries—and newer economic priorities, all while strictly adhering to marine conservation targets.

In the western Black Sea, both Romania and Bulgaria have integrated their Maritime Spatial Planning (MSP) obligations under EU Directive 2014/89/EU directly into their regional development ministries. In Romania, the Ministry of Development, Public Works and Administration (MDLPA) serves as the central competent authority that successfully spearheaded the drafting and adoption of the nation's first comprehensive Maritime Spatial Plan. Similarly, Bulgaria's Ministry of Regional Development and Public Works (MRDPW) acts as the managing authority for its own national MSP framework, which officially entered into force in 2023. These ministries provide the legal, structural, and spatial coordinates that govern long-term investments, carefully mapping out the temporal and spatial distribution of maritime activities across their territorial seas and Exclusive Economic Zones (EEZs).

Operating in tandem with these spatial planning frameworks, the specialized ministries of energy in both countries are actively transforming the industrial landscape of the western basin. Romania's Ministry of Energy is a primary catalyst driving this transition, heavily focused on the operationalization of its historic Offshore Wind Law and coordinating large-scale transitional projects like the "Neptun Deep" natural gas venture, slated for first gas delivery. To support this massive influx of marine energy, the ministry is also directing grid reinforcements and facilitating necessary infrastructure upgrades at major maritime hubs. Concurrently, Bulgaria's Ministry of Energy is implementing the Integrated National Energy and Climate Plan (INECP), which establishes the strategic framework for the country's energy transition, including offshore renewable energy, while offshore hydrocarbon exploration continues under the national legal framework governing the exercise of Bulgaria's sovereign rights over the continental shelf in accordance with UNCLOS. Together, these energy and regional development ministries form a critical policy matrix, ensuring that the industrialization of the Black Sea's offshore frontier remains orderly, legally secure, and integrated into broader European energy networks.

The following table summarizes the primary national authorities leading key blue economy sectors across the four analyzed states:

Table 1: Cross-basin institutional matrix

Blue economy domain	Romania	Bulgaria	Türkiye	Georgia
Environment and protection	Ministry of Environment, Waters and Forests	Ministry of Environment and Water	Ministry of Environment, Urbanization and Climate Change	Ministry of Environmental Protection and Agriculture
Maritime transport and ports	Ministry of Transport and Infrastructure	Ministry of Transport and Communications	Ministry of Transport and Infrastructure	Ministry of Economy and Sustainable Development

Fisheries and aquaculture	Ministry of Agriculture and Rural Development	Ministry of Agriculture and Food	Ministry of Agriculture and Forestry	Ministry of Environmental Protection and Agriculture
Coastal and maritime tourism	Ministry of Economy, Entrepreneurship and Tourism	Ministry of Tourism	Ministry of Culture and Tourism	Ministry of Economy and Sustainable Development
Spatial/regional planning	Ministry of Development, Public Works and Administration	Ministry of Regional Development and Public Works	Ministry of Industry and Technology	Ministry of Regional Development and Infrastructure
Offshore energy	Ministry of Energy	Ministry of Energy	<i>Multiple Authorities</i>	<i>N/A (Current Focus)</i>

Subnational authorities and innovation drivers

Beyond the centralized national ministries, the successful and grounded implementation of the blue economy relies heavily on the operational capacity of subnational and regional actors. In Türkiye, regional development agencies act as vital catalysts; for instance, the Eastern Black Sea Development Agency (DOKA) has explicitly designated the blue economy as a regional priority, actively driving SME transformation, clustering, and local infrastructure projects through specialized, result-oriented programs. In the EU member states of Romania and Bulgaria, regional development is intrinsically linked to the strategic management of European territorial cooperation funds, specifically through the INTERREG cross-border programs. These financial mechanisms empower coastal municipalities to fund joint environmental resilience and digitalization initiatives. Meanwhile, in Georgia, the operational execution of blue economy policies falls heavily on municipal authorities in coastal regions—such as Adjara, Guria, and Samegrelo-Zemo Svaneti. These local governments are directly responsible for spatial planning, destination management, and the provision of municipal infrastructure to support the tourism and maritime sectors on the ground.

The transition toward a high-tech, sustainable blue economy is strictly underpinned by robust research, skills, and innovation ecosystems. Across the basin, education and research ministries play a critical role in funding and operationalizing the Strategic Research and Innovation Agenda (SRIA), which serves as the scientific pillar of the Common Maritime Agenda. National institutions—including Romania's Ministry of Research, Innovation and Digitalization (MCID), Bulgaria's Ministry of Innovation and Digital Transformation (MIDT), Georgia's Shota Rustaveli National Science Foundation (SRNSFG), and Türkiye's scientific and technological research council (TÜBİTAK)—provide the essential capital and technological frameworks needed to modernize maritime industries. These entities drive funding toward cutting-edge initiatives such as blue biotechnologies, the development of complex virtual models like the "Digital Twin of the Black Sea," and automated oceanographic observation. Furthermore, specialized workforce training is secured through dedicated maritime higher education institutions, such as the naval academies in Romania and Bulgaria, ensuring that human capital can meet the complex engineering and digital demands of emerging blue sectors. Finally, the sustainable expansion of the blue economy cannot occur in a vacuum; it requires a firm foundation of geopolitical stability and physical security. Foreign affairs and defense ministries across the basin—notably Romania's Ministry of Foreign Affairs (MAE) and Ministry of

National Defence (MApN), alongside Bulgaria's respective diplomatic and military institutions—are instrumental in providing the architectural stability necessary to attract long-term foreign direct investment. Diplomatically, these institutions champion national maritime interests within multilateral frameworks like the Organization of the Black Sea Economic Cooperation (BSEC) and the Common Maritime Agenda, ensuring regional synchronization. Militarily, they guarantee the unhindered safety of commercial shipping lanes and protect critical offshore infrastructure—such as natural gas platforms, subsea cables, and future wind farms—against asymmetric threats and regional volatility, thereby signaling to global investors that the Black Sea maritime domain remains legally secure and operationally resilient.

Research and academia: knowledge production and blue skills

The sustainable expansion and structural transformation of the Black Sea's blue economy are fundamentally dependent on a highly specialized scientific and academic community. Across the basin, higher education institutions, national research centers, and specialized vocational academies bridge the gap between rigorous regulatory mandates—such as the European Green Deal and the Common Maritime Agenda—and practical industrial applications. These institutions provide the critical oceanographic data, technological innovations, and advanced human capital required to ensure that maritime economic exploitation remains within safe ecological thresholds.

National scientific and educational ecosystems

In **Romania**, the marine scientific community operates a robust network of research institutes and multidisciplinary universities concentrated around the Danube-Black Sea nexus. The National Institute for Marine Research and Development "Grigore Antipa" (NIMRD) in Constanța serves as the technical cornerstone for national environmental monitoring, assessing Good Environmental Status (GES) under the EU Marine Strategy Framework Directive and setting Total Allowable Catch quotas for commercial fisheries. Physical maritime spatial planning and subsea resource mapping are driven by the National Institute of Marine Geology and Geoecology (GeoEcoMar), which is actively pioneering the "Digital Twin" of the Romanian Coastal Zone via the GEOMARDIGITAL project to simulate climate-driven erosion and test infrastructure hydrodynamics. High-level human capital and specialized training are anchored by Ovidius University of Constanța, which drives regional science diplomacy and socio-economic circular economy models, alongside the globally certified Constanța Maritime University (CMU) and the "Mircea cel Bătrân" Naval Academy, both of which aggressively target the maritime skills gap, decarbonized transport logistics, and emerging offshore wind technologies. This coastal network is complemented by inland pillars like the "Dunărea de Jos" University of Galați, which holds exclusive expertise in naval architecture and high-yield recirculating aquaculture systems (RAS), the Technical University of Civil Engineering Bucharest (UTCB) through its role in the EU-CONEXUS alliance for smart coastal sustainability, and the centenary Marine Biological Station at Agigea operated by the University of Iași.

In **Bulgaria**, marine science and technology knowledge production are heavily concentrated in the principal maritime city of Varna. The "Fridtjof Nansen" Institute of Oceanology (IO-BAS), operating under the Bulgarian Academy of Sciences, leads the nation in physical oceanography, marine geology, and ecosystem monitoring, feeding critical data directly into global networks like EMODnet and Copernicus. Industrial marine engineering, naval architecture, and underwater acoustics are driven by the specialized Bulgarian Ship Hydrodynamics Centre (BSHC). Living resource management and aquaculture systems are scientifically managed by the Institute of

Fisheries and Aquaculture (IFA) in Varna under the Ministry of Agriculture and Food. Bulgaria also boasts a unique global asset in the Institute for Underwater Heritage in Sozopol, formally designated as a UNESCO Category 2 Institute in early 2026 to govern subaquatic cultural heritage within maritime spatial frameworks. Workforce training and "blue skills" development are structurally secured through the prestigious Nikola Vaptsarov Naval Academy, the Technical University of Varna, and specialized horizontal economic and environmental programs at the University of Economics Varna, Burgas Free University, and Prof. Dr. Assen Zlatarov University. Furthermore, the region's operational human performance research saw a major milestone in May 2026 with the opening of Bulgaria's first dedicated marine medicine laboratory at the Medical University of Varna.

In **Türkiye**, the maritime research dimension is exceptionally robust and well-funded, supported by specialized faculties spread across its vast coastline. Black Sea oceanography, complex ecosystem modeling, and advanced marine observation are anchored by the Middle East Technical University Institute of Marine Sciences (METU-IMS). Applied research on Black Sea fisheries, aquaculture technologies, and regional human capital is heavily driven by the Karadeniz Technical University (KTÜ) Faculty of Marine Sciences, the Central Fisheries Research Institute (SUMAE) in Trabzon, and dedicated regional groups at Sinop University, Recep Tayyip Erdoğan University, and Ordu University. Legal governance and maritime spatial planning frameworks are synthesized by the Ankara University National Center for the Sea and Maritime Law (DEHUKAM), while advanced naval architecture, marine electronics, and transport logistics are led by major metropolitan centers including Istanbul Technical University and Piri Reis University. This academic foundation is strongly backed by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) and regional development catalysts like DOKA, which finance commercialization, applied R&D, and environmental technologies.

In **Georgia**, the research and academic landscape is tightly aligned with environmental monitoring, natural resource management, and maritime vocational training, though it operates through more sector-specific channels. Multidisciplinary ecological research, biodiversity studies, and regional economic analysis are carried out by Ivane Javakhishvili Tbilisi State University (TSU) and Ilia State University. Along the immediate coastal zone, the Batumi State Maritime Academy (BSMA), Batumi Navigation University, and Batumi Shota Rustaveli State University (BSU) serve as the primary engines for seafarer training, marine education, and applied coastal studies. Public oceanographic data collection and environmental monitoring are systematically executed by the state-level National Environment Agency, while scientific funding and international alignment are coordinated through the Shota Rustaveli National Science Foundation of Georgia (SRNSFG) and the Horizon Europe Georgia Office.

Transnational collaboration and regional science diplomacy

A defining feature of the Black Sea's academic landscape is its integration into cross-border, basin-wide scientific initiatives. Rather than operating in domestic isolation, these institutions are systematically linked via the Black Sea Strategic Research and Innovation Agenda (SRIA) and its active Implementation Plan. Through associations with EU framework programs like Horizon Europe and the Sustainable Blue Economy Partnership (SBEP), universities and institutes across Romania, Bulgaria, Türkiye, and Georgia actively collaborate on landmark transboundary initiatives such as the DOORS (Developing Optimal Black Sea Research-Infrastructures) and BRIDGE-BS projects. These joint frameworks are building an integrated "System of Systems" for real-time oceanographic modeling, mapping vulnerable marine habitats, and testing nature-based solutions. Through high-profile knowledge-transfer platforms—such as the basin-wide MARBLUE 2026 International Joint Conference hosted in

Romania—the regional academic community acts as a primary vehicle for science diplomacy, aligning separate national data flows into a unified, coherent strategy for sustainable Black Sea development.

The following table summarizes the primary research, academic, and vocational actors driving the blue economy across the four analyzed Black Sea countries:

Table 2: Cross-basin research and academic matrix

Country	Key institutions and actor groups	Core blue economy contribution
Romania	NIMRD, "Grigore Antipa", GeoEcoMar, Ovidius University, Constanța Maritime University, University of Galați (UDJG), "Mircea cel Bătrân" Naval Academy, UTCB (EU-CONEXUS), UAIC Agigea Station.	Enforces MSFD monitoring, builds coastal Digital Twins, trains maritime officers and engineers, researches advanced marine aquaculture and green hull propulsion systems.
Bulgaria	IO-BAS, BSHC, IFA Varna, Institute for Underwater Heritage (UNESCO), Nikola Vaptsarov Naval Academy, TU Varna, University of Economics Varna, Burgas Free University, Medical University of Varna.	Drives physical oceanography, conducts advanced ship hydrodynamics and fisheries stock assessments, protects subaquatic heritage, provides STCW-compliant seafarer training, and researches maritime occupational health.
Türkiye	METU-IMS, Karadeniz Technical University (KTÜ), SUMAE, DEHUKAM, Istanbul Technical University, Piri Reis University, Sinop University, TÜBİTAK, DOKA.	Advances ecosystem modeling, leads regional fisheries and aquaculture R&D, formulates international maritime law, funds blue technology innovation, and coordinates SRIA regional actions.
Georgia	Tbilisi State University (TSU), Ilia State University, Batumi State Maritime Academy (BSMA), Batumi Navigation University, BSU, National Environment Agency, SRNSFG.	Conducts baseline environmental monitoring, manages marine hydrological data, provides certified international seafarer and logistics education, and supports Horizon Europe research integration.

Business support organizations: catalyzing the blue economy

The successful transition toward a sustainable, high-value blue economy relies not only on government regulation and academic research but also on a robust commercial ecosystem. Across the Black Sea basin, business support organizations—ranging from dedicated maritime clusters to traditional chambers of commerce and EU-backed accelerators—serve as the vital bridge between policy frameworks and the private sector. These entities facilitate cross-sectoral cooperation, attract foreign investment, and provide the practical scaffolding that small and medium-sized enterprises (SMEs) need to scale marine innovations.

National business support ecosystems

In Romania, the commercial blue economy is driven by a highly networked ecosystem of specialized organizations. The Romanian Maritime Cluster acts as the primary advocacy platform, consolidating traditional industries (like shipbuilding and ship repair) while actively pivoting members toward emerging opportunities such as offshore wind and green shipping. At the regional level, the Chamber of Commerce, Industry, Navigation and Agriculture Constanța (CCINA) serves as the operational hub for the Dobrogea business community, fostering international B2B partnerships and hosting premier events like Maritime Business Week. Crucially, Romanian start-ups benefit directly from European incubators: the Black Sea Assistance Mechanism (BSAM) operates the national hub to guide entrepreneurs through complex EU funding landscapes (like EMFAF), while the Blue Growth Accelerator, funded via the Horizon DOORS project, translates raw marine science into commercial viability by connecting innovators in blue biotechnology and coastal resilience directly with global investors. In Bulgaria, blue economy businesses are supported through a broad network of sector-specific associations, clusters and business support organisations. Marine Cluster Bulgaria, a non-governmental organisation based in Varna brings together stakeholders from across the Blue Economy sectors to strengthen cooperation, innovation and contribute to the sustainable growth of the Blue economy sectors at both national and European level. As a full member of the European Network of Maritime Clusters (ENMC), it provides SMEs, research institutes, and port operators with a unified platform for knowledge exchange and internationalization. Marine Cluster Bulgaria also holds strategic importance by serving as the Bulgarian National Hub for the Common Maritime Agenda (CMA) under BSAM. In its capacity of one of the partnering host organizations of Enterprise Europe Network (EEN) in Bulgaria and through international initiatives and EU funded projects as 4BIZ project (EMFAF), the cluster actively supports Bulgarian companies in accessing cross-border funding to decarbonize maritime transport, develop sustainable marine tourism, and expand aquaculture operations.

In Türkiye, the scale of the maritime industry demands a vast and highly structured support network. The commercial bridge is maintained by powerful national bodies such as the Union of Chambers and Commodity Exchanges of Türkiye (TOBB), the IMEAK Chamber of Shipping, and the Port Operators Association (TÜRKLİM). For the massive fisheries and aquaculture sector, umbrella organizations are critical: the Central Union of Fisheries Cooperatives (SÜR-KOOP), alongside major producer associations like SUYMERBİR and DEM-BİR, play an indispensable role in improving traceability, organizing producers, and ensuring sustainable practices. In the Eastern Black Sea region, entities like the Eastern Black Sea Exporters Association and the Eastern Black Sea Development Agency (DOKA) aggressively mobilize the private sector. DOKA, in particular, advocates for a cluster-based approach to blue business development, emphasizing internationalization and technical cooperation to link regional firms with global maritime value chains.

In Georgia, the business support landscape is evolving but remains largely organized along traditional sectoral lines rather than integrated maritime value chains. Currently, Georgia lacks formalized, dedicated blue economy clusters. Instead, business support is channeled through the Georgian Chamber of Commerce and Industry (GCCI) and the regional Adjara Chamber of Commerce and Industry, which provide essential advocacy, networking, and advisory services. Given the country's strategic economic focus, private sector support in the coastal zone is heavily concentrated on tourism—driven by regional tourism organizations in Adjara—and on transport and logistics, represented by individual port operators and logistics associations. While

effective in their specific domains, these organizations represent a fragmented ecosystem that is increasingly looking to integrate into broader Black Sea blue economy networks.

The following table summarizes the principal business support organizations, maritime clusters, and accelerators driving commercial blue economy development across the four countries:

Table 3: Cross-basin business support matrix

Country	Key organizations and clusters	Core blue economy functions
Romania	Romanian Maritime Cluster, CCINA Constanța, BSAM National Hub, DOORS Blue Growth Accelerator.	Facilitates B2B partnerships, incubates blue tech start-ups, integrates local maritime SMEs into EU funding programs (e.g., 4BIZ).
Bulgaria	Marine Cluster Bulgaria, Enterprise Europe Network (Varna).	Consolidates national maritime sectors, acts as the CMA National Hub, drives SME internationalization and European integration.
Türkiye	TOBB, IMEAK Chamber of Shipping, TÜRKLİM, SÜR-KOOP, SUYMERBİR, DEM-BİR, DOKA.	Provides massive-scale industrial advocacy, manages port/shipping logistics networks, supports regional cluster-based development.
Georgia	Georgian Chamber of Commerce and Industry (GCCCI), Adjara Chamber of Commerce, Regional Tourism Associations.	Delivers traditional private sector advocacy, focuses heavily on coastal tourism destination management and logistics networking.

Civil Society Organisations: guardians of blue economy

Across the Black Sea basin, the sustainable expansion of the blue economy relies heavily on an active and highly specialized civil society sector. In a region where environmental pressures—such as marine litter, river-borne pollution, and habitat degradation—are localized in impact but basin-wide in origin, Non-Governmental Organizations (NGOs) and community groups serve as vital watchdogs. They act as citizen science coordinators, advocates for participatory governance, and crucial implementation partners for major transboundary environmental initiatives, ensuring that economic growth remains tethered to ecological stewardship and social inclusion.

National civil society ecosystems

In Romania, the civil society sector is technically advanced and deeply integrated into marine conservation. The Constanța-based Mare Nostrum NGO is the most prominent domestic environmental organization dedicated to the Black Sea. It serves as a regional leader in cross-border initiatives (such as the MARMAPS, DOORS, and ANEMONE PLUS projects) and is currently coordinating the EU-funded BlackNETs project, which actively maps and removes "ghost nets" across the basin. Mare Nostrum provides critical empirical data on beach litter, operates a rapid-response network for stranded cetaceans, and functions as the National Hub for the CMA. Similarly, WWF Romania bridges the gap between conservation and coastal realities, aggressively combating illegal sturgeon poaching while negotiating sustainable, bycatch-reducing practices with commercial fisheries. Technical field support is provided by the Oceanic Club, which utilizes ROVs and drones to conduct high-resolution benthic mapping and independent environmental impact assessments. Furthermore, ornithological NGOs like the

Romanian Ornithological Society (SOR) are indispensable for Maritime Spatial Planning; their baseline data on the critical Via Pontica flyway ensures that offshore wind farms do not disrupt vulnerable migratory bird populations.

In Bulgaria, civil society organizations encompass both highly structured environmental NGOs and influential industry associations. On the environmental front, WWF Bulgaria and Greenpeace Bulgaria lead campaigns targeting marine protected areas, biodiversity conservation, and the reduction of plastic pollution. Organizations like the Via Pontica Foundation in Burgas specialize in wetland conservation, while research-oriented non-profits such as the Centre for Coastal and Marine Studies (CCMS) and the Black Sea–Danube Association for Research and Development (BDCA) provide the scientific models and GIS solutions needed for coastal resilience planning. Unique to Bulgaria is the Black Sea NGO Network (BSNN), a regional association headquartered in Varna that holds observer status at the Bucharest Convention, directly linking grassroots civil society to high-level regional governance.

In Türkiye, the scale of the coastline necessitates massive public awareness and community-level intervention. Nationally visible actors such as TURMEPA, WWF-Türkiye, and the TEMA Foundation operate alongside local environmental associations to combat marine litter through widespread coastal clean-ups and environmental education. Civil society here is deeply tied to social inclusion and "blue skills"; women's cooperatives, amateur fishing associations, and local diving clubs are heavily integrated into blue economy frameworks. In regions like the Eastern Black Sea (TR90), organizations such as the Blue and Green Ecosystem Development Association and local sailing clubs in Trabzon blend environmental stewardship with community entrepreneurship, ensuring that traditional gastronomy and fisheries heritage remain economically viable.

In Georgia, civil society engagement is primarily centered around environmental protection, climate resilience, and community-based development. Relevant actors include conservation groups like SABUKO (focusing on biodiversity and sustainable natural resource use), the Greens Movement of Georgia, and WWF-Caucasus, which spearhead protected area initiatives. These organizations advocate for participatory governance in coastal areas undergoing rapid tourism development and infrastructure expansion. While highly effective in environmental advocacy and public education, Georgia's civil society remains somewhat fragmented; its integration into broader, cross-sectoral blue economy coordination—such as linking directly with maritime innovation and private sector logistics—is not yet fully institutionalized.

Bridging the gap: Regional Advisory Councils and FLAGS

Beyond traditional NGOs, the basin utilizes specialized structural platforms to ensure civil society has a direct say in economic governance.

- **The Black Sea Advisory Council (BISAC):** An EU-mandated regional platform (highly active in Romania and Bulgaria) that bridges commercial maritime industries with civil society. With a strict mandate reserving 40% of its seats for environmental NGOs and consumer advocates, BISAC provides direct, consensus-driven recommendations to the European Commission regarding the sustainable management of fisheries, ensuring that fishing quotas (TACs) align with ecological realities.
- **Fisheries Local Action Groups (FLAGS):** Operating extensively along the Romanian and Bulgarian coasts, FLAGS are the primary mechanism for Community-Led Local Development (CLLD). These groups (such as FLAG Dobrogea Nord and FLAG Dobrogea Sud in Romania) operate at the intersection of public administration, private

enterprise, and civil society. By distributing targeted EU grants, FLAGS empower traditional fishing communities to modernize fleets sustainably, pivot toward "blue tourism" (like pescatourism), and fund essential water quality research, embedding circular economy principles directly into the local fabric.

The following table summarizes the principal civil society actors and governance platforms shaping the blue economy across the four countries:

Table 4: Cross-basin civil society matrix

Country	Key organizations and platforms	Core blue economy functions
Romania	Mare Nostrum NGO, WWF Romania, Oceanic Club, SOR, FLAGS (Dobrogea Nord/Sud).	Leads basin-wide citizen science (e.g., BlackNETs), conducts ROV benthic mapping, protects sturgeon, and drives community-led blue tourism via FLAGS.
Bulgaria	WWF Bulgaria, Greenpeace Bulgaria, Via Pontica Foundation, BSNN, CCMS, BDCA.	Models coastal hydrodynamics, protects wetland biodiversity, and drives transboundary governance via the Black Sea NGO Network.
Türkiye	TURMEPA, WWF-Türkiye, TEMA Foundation, Regional Sailing/Diving Clubs, Women's Cooperatives.	Executes massive public awareness/clean-up campaigns, integrates community entrepreneurship into regional blue economy value chains.
Georgia	SABUKO, Greens Movement of Georgia, WWF-Caucasus, CENN.	Advocates for sustainable coastal development, protects biodiversity, and mitigates the environmental impact of rapid tourism expansion.

Legal and strategic framework

The governance of the blue economy in the Black Sea region operates within a complex, multi-layered architecture that spans global, regional, EU, and national levels. For the partner countries of the BlueDial project—Romania, Bulgaria, Georgia, and Türkiye—harmonizing this legal and strategic framework is essential for advancing a sustainable, coordinated maritime economy. While these four nations share the semi-enclosed maritime space of the Black Sea, they represent diverse geopolitical and legal contexts: Romania and Bulgaria are bound by the European Union's comprehensive maritime and environmental *acquis*, whereas Georgia and Türkiye engage through distinct association, candidate, and bilateral pathways.

Despite these differing national contexts, all four states must navigate a common external governance environment. This chapter outlines the state of the art of the legal and strategic framework governing the blue economy across these nations. It begins by examining the foundational international conventions and global sustainability commitments that set the baseline for maritime activities. It then explores how these global mandates cascade into

regional cooperation mechanisms—notably the Common Maritime Agenda for the Black Sea—before analyzing the specific national policy landscapes of Romania, Bulgaria, Georgia, and Türkiye, highlighting both convergences and opportunities for cross-border alignment.

Global and international governance framework

The governance of the blue economy operates within a multi-layered hierarchy of international, regional, EU, and national legal instruments. At the apex of this hierarchy are three foundational global pillars: the framework for maritime jurisdiction (primarily UNCLOS), the international regulatory system for maritime safety and environmental protection overseen by the International Maritime Organization (IMO), and the overarching sustainability targets established by the United Nations Sustainable Development Goals (SDGs). These instruments define the legal basis for maritime sovereignty, prescribe binding standards for shipping, and set global biodiversity and climate goals. For the BlueDial partner countries—Romania, Bulgaria, Georgia, and Türkiye—this global architecture forms the external environment shaping domestic Blue Economy policies. With the global ocean economy projected by the OECD to reach USD 3 trillion and support 40 million jobs by 2030, coordinated adherence to these international frameworks is critical for the sustainable development of the Black Sea.

United Nations Convention on the Law of the Sea (UNCLOS) and Maritime Jurisdiction

The United Nations Convention on the Law of the Sea (UNCLOS), opened for signature in 1982 and in force since 1994, constitutes the overarching international legal framework for all activities conducted in, on, or under the ocean. Widely characterized as the "constitution for the oceans," UNCLOS establishes a comprehensive system of maritime zones—the territorial sea (12 nautical miles), the contiguous zone (24 nautical miles), the Exclusive Economic Zone (EEZ, 200 nautical miles), the continental shelf, and the high seas. These jurisdictional zones form the legal foundation for core blue economy activities, including fisheries, offshore energy development, maritime transport, and marine scientific research. UNCLOS Part XII establishes general obligations to protect the marine environment, while Part XV provides dispute settlement procedures.

As coastal states bordering the Black Sea—defined as a semi-enclosed sea under UNCLOS Article 122—Romania, Bulgaria, Georgia, and Türkiye operate within a geographically confined maritime space where full 200-nautical-mile EEZs overlap, necessitating maritime boundary delimitations.

Critically, the legal approach to maritime jurisdiction varies among the BlueDial partners. Romania, Bulgaria, and Georgia are State Parties to UNCLOS, exercising their sovereign rights over EEZ resources directly under the Convention's provisions. Conversely, Türkiye is not a signatory to UNCLOS. Instead, Türkiye asserts its maritime jurisdiction and boundary delimitations through customary international law, domestic legislation, and bilateral agreements. Despite these differing legal foundations, the maritime boundaries between these four states in the Black Sea have largely been established and stabilized through bilateral treaties based on the principles of equidistance and equity, providing a secure jurisdictional basis for the region's blue economy.

International Maritime Organization (IMO)

The International Maritime Organization (IMO), a specialized agency of the United Nations, is the global standard-setting authority for the safety, security, and environmental performance of international shipping. Its regulatory framework ensures that the shipping industry—a central

pillar of the Blue Economy—operates sustainably and efficiently. Core conventions include the International Convention for the Prevention of Pollution from Ships (MARPOL), the International Convention for the Safety of Life at Sea (SOLAS), the Convention on the International Regulations for Preventing Collisions at Sea (COLREG), and the Ballast Water Management (BWM) Convention.

Romania, Bulgaria, Georgia, and Türkiye are all Member States of the IMO and parties to its major conventions. Because the Black Sea is a critical corridor for international maritime transport, ensuring strict compliance with IMO regulations is fundamental to the region. As flag states, these four nations are legally responsible for ensuring that vessels registered under their flags comply with global safety and pollution prevention standards. Furthermore, as port and coastal states, they enforce these regulations on foreign vessels entering their waters through Port State Control mechanisms. Regionally, this is coordinated via the Black Sea Memorandum of Understanding (BS MoU) on Port State Control, which harmonizes inspections across the basin to prevent accidents, mitigate marine pollution, and facilitate secure maritime trade.

UN Sustainable Development Goals, Biodiversity Framework, and International Blue Economy Declarations

The United Nations 2030 Agenda for Sustainable Development establishes the normative reference for sustainable ocean governance, primarily through SDG 14 (Life Below Water) and SDG 13 (Climate Action). These goals mandate the reduction of marine pollution, sustainable fisheries management, and the protection of coastal ecosystems. For the EU Member States (Romania and Bulgaria), these goals are legally operationalized through instruments like the Marine Strategy Framework Directive (MSFD) and the European Green Deal. For Georgia and Türkiye, they are integrated into national development strategies and aligned with regional environmental frameworks such as the Bucharest Convention.

Furthermore, the Kunming-Montreal Global Biodiversity Framework (GBF), adopted at CBD COP15 in 2022, establishes the landmark "30x30 target" to conserve 30% of global marine and coastal areas by 2030. Within the BlueDial consortium, this commitment is realized through distinct but complementary mechanisms: Romania and Bulgaria implement it primarily via the EU Biodiversity Strategy 2030 and the Natura 2000 network, while Georgia and Türkiye advance these targets through the expansion of their national Marine Protected Area (MPA) networks and participation in the Emerald Network.

International consensus on sustainable ocean governance is further shaped by influential non-binding declarations, such as the UNEP-FI Sustainable Blue Economy Finance Principles, the G20 High-Level Principles on Sustainable and Resilient Ocean-based Economy, and the COP28 Dubai Ocean Declaration. Taken together, these global frameworks provide the shared strategic compass for Romania, Bulgaria, Georgia, and Türkiye, underpinning cross-border alignment efforts to transition toward a sustainable, climate-resilient blue economy in the Black Sea.

Global fisheries and marine conservation instruments

Fisheries remain a cornerstone of the Black Sea's Blue Economy, making global agreements that combat illegal, unreported, and unregulated (IUU) fishing essential to the region's governance framework. Central to this is the FAO Port State Measures Agreement (PSMA), the first binding international treaty specifically targeting IUU fishing by preventing non-compliant vessels from using ports and landing their catches. For the Black Sea, this global mandate has been explicitly regionalized through the Bucharest Declaration on Black Sea Cooperation for

fisheries and aquaculture, binding Romania, Bulgaria, Georgia, and Türkiye to a collaborative approach to resource exploitation and the protection of marine living resources.

Complementing the PSMA is the WTO Agreement on Fisheries Subsidies, a historic multilateral trade pact that explicitly ties global trade rules to environmental sustainability. By prohibiting government subsidies for IUU fishing and the targeting of overfished stocks, this agreement fundamentally reshapes the financial governance of the global fishing industry. For the BlueDial partner countries, this framework compels the alignment of national fleet support mechanisms and blue economy investments with global sustainability targets.

Finally, the recent adoption of the Agreement on Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ or High Seas Treaty) represents a paradigm shift in global ocean governance. While the semi-enclosed Black Sea consists entirely of national jurisdictions, the BBNJ treaty's rigorous new standards for Marine Environmental Impact Assessments (EIAs) and area-based management tools are rapidly influencing the broader international maritime law landscape. These standards are cascading into the EU's maritime *acquis* and shaping the regulatory expectations for all modern Blue Economy developments, including offshore energy and seabed activities.

Regional cooperation mechanisms for the Black Sea

The translation of global governance frameworks into actionable policies relies entirely on regional cooperation. Because the Black Sea is a highly enclosed, shared marine ecosystem, environmental degradation or unsustainable resource extraction in one jurisdiction inevitably impacts the others. No single nation can achieve sustainable blue economy goals in isolation. For Romania, Bulgaria, Georgia, and Türkiye, two primary regional instruments bridge the gap between global international mandates and national implementation: the Bucharest Convention, which governs environmental protection, and the Common Maritime Agenda (CMA), which coordinates sustainable economic development.

Common Maritime Agenda for the Black Sea (CMA)

While the Bucharest Convention focuses on environmental protection, the Common Maritime Agenda (CMA) for the Black Sea serves as the strategic engine for economic cooperation. Endorsed in May 2019 by seven participating countries, the CMA is a unique sea-basin initiative backed by the European Commission. It is designed to reinforce regional dialogue, ensuring that economic growth aligns with environmental sustainability.

The CMA is structured around three core goals:

1. **Healthy marine and coastal ecosystems:** Addressing pollution, marine litter, and biodiversity loss.
2. **A competitive, innovative, and sustainable Blue Economy:** Promoting sustainable fisheries, aquaculture, coastal tourism, blue skills, and maritime digitalization.
3. **Fostering investment:** Improving access to financial resources and encouraging sustainable investments in Blue Economy sectors.

The governance of the CMA is highly collaborative, driven by a Steering Group with a rotating annual coordination role—a responsibility already held by Bulgaria (2020), Türkiye (2021), Georgia (2022), Romania (2023). Implementation is supported practically by the **Black Sea Assistance Mechanism (BSAM)** through National Hubs in each country, and scientifically by the

Strategic Research and Innovation Agenda (SRIA), which ensures that regional maritime policies are grounded in robust, science-based decision-making.

Crucially for the BlueDial project, the CMA acts as an equalizer. It aligns the maritime strategies of non-EU states (Georgia and Türkiye) with the broader EU Blue Economy priorities guiding EU Member States (Romania and Bulgaria), creating a cohesive, basin-wide framework for innovation, investment, and sustainable development.

The Bucharest Convention

The Convention on the Protection of the Black Sea Against Pollution, widely known as the Bucharest Convention, is the cornerstone of regional environmental law. Signed in 1992 and ratified by 1994, it is the only binding legal instrument concerning the marine environment that includes all six Black Sea riparian states.

The Convention obligates its contracting parties to prevent, reduce, and control pollution to protect and preserve the marine ecosystem. It operates through specific thematic protocols addressing the most pressing regional threats, including land-based sources of pollution, dumping of waste, joint action in emergency situations (such as oil spills), and the conservation of biodiversity and landscapes.

The implementation of the Convention is overseen by the Black Sea Commission (BSC), headquartered in Istanbul. For the Blue Economy, the Bucharest Convention is foundational: a healthy marine ecosystem is the fundamental prerequisite for sustainable fisheries, coastal tourism, and marine biotechnology. By establishing shared environmental standards and monitoring requirements, the Convention ensures that the economic ambitions of Romania, Bulgaria, Georgia, and Türkiye do not compromise the basin's ecological carrying capacity.

Regional Fisheries Governance: The GFCM and the Sofia Declaration

While the CMA outlines strategic goals for the Blue Economy, the specific regulatory governance of regional fisheries and aquaculture falls under the mandate of the General Fisheries Commission for the Mediterranean (GFCM), a regional fisheries management organization established under the FAO. Despite its name, the GFCM's constitutive agreement explicitly includes the Black Sea, making it the binding regulatory body for fisheries management in the basin.

For Romania, Bulgaria, Georgia, and Türkiye, the GFCM framework represents a vital mechanism for aligning national fishing quotas, gear regulations, and closed seasons across borders. The cornerstone of this regional alignment is the 2018 Sofia Ministerial Declaration on Black Sea Fisheries and Aquaculture. Signed by all Black Sea riparian states and the European Commission, the Sofia Declaration established a 10-year pledge to rebuild regional fish stocks, combat Illegal, Unreported, and Unregulated (IUU) fishing, and boost sustainable aquaculture.

Through the Sofia Declaration and the GFCM's dedicated Working Group on the Black Sea (WGBS), the region operates joint data collection initiatives (such as the BlackSea4Fish project) and implements harmonized, binding management plans for commercially critical, highly migratory species like turbot and sprat, ensuring that regional Blue Economy fisheries remain commercially viable and ecologically sustainable.

Regional Economic and Financial Coordination: BSEC and the BBSEA Program

At the institutional level, the Organization of the Black Sea Economic Cooperation (BSEC) serves as the oldest and most established intergovernmental forum in the region. Headquartered in Istanbul, BSEC encompasses all Black Sea littoral states (including the four

BlueDial partners) and focuses heavily on maritime transport, trade facilitation, and environmental protection. BSEC operates a dedicated Working Group on Transport and has increasingly integrated Blue Economy principles into its economic mandate, acting as a crucial diplomatic bridge between EU Member States and non-EU partners in the region.

To operationalize the economic and environmental goals set by the CMA, the Bucharest Convention, and BSEC, regional governance is heavily supported by the Blueing the Black Sea (BBSEA) Program, an initiative led by the World Bank. The BBSEA program functions as a critical financial and technical coordination mechanism specifically aimed at addressing the severe nutrient and chemical pollution that threatens the Black Sea's blue economy. By providing targeted investment for pollution reduction, eco-innovation, and climate resilience, the BBSEA program helps Romania, Bulgaria, Georgia, and Türkiye translate regional declarations into on-the-ground infrastructure and capacity-building projects.

EU legal and strategic framework

The European Union's regulatory and strategic framework serves as the structural engine driving the modern transformation of the Blue Economy across the Black Sea basin. This framework has undergone a profound paradigm shift: moving from the fragmented, sector-specific management of the historic Integrated Maritime Policy (IMP) and the extraction-focused Blue Growth Strategy, it has evolved into a deeply integrated, circular, and nature-positive model. This modern approach is anchored macro-economically by the European Green Deal and unified by the landmark European Ocean Pact (adopted in 2025), which legally and strategically binds ocean health, climate neutrality, maritime security, and economic competitiveness into a single governance framework.

For the BlueDial project, this EU architecture operates via two distinct operational tracks:

- EU Member States (Romania and Bulgaria): These directives and regulations constitute binding national laws, requiring complete transposition, strict monitoring, and compliance with rigid deadlines (such as the "30x30" biodiversity targets and climate neutrality by 2050).
- Non-EU riparian partners (Georgia and Türkiye): While these frameworks do not carry direct national statutory power, they serve as the fundamental external benchmarks for international alignment, pre-accession strategies, association agreements, and regional funding mechanisms under the Common Maritime Agenda (CMA).

Environmental and ecosystem-based water governance

To prevent the ecological degradation of the shared Black Sea basin, the EU enforces a highly rigorous, multi-layered water governance system that treats inland waterways, coastal zones, and exclusive economic zones (EEZs) as a singular, interconnected hydrological continuum.

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

The MSFD functions as the primary environmental safeguard for the maritime economy, legally mandating member states to achieve and maintain Good Environmental Status (GES) across their marine waters through continuous six-year adaptive management cycles. It requires the systematic assessment of 11 qualitative descriptors, including biodiversity, seafloor integrity, underwater noise, and marine litter.

- Romania and Bulgaria: Romania's technical monitoring is led by the National Institute for Marine Research and Development (NIMRD), forcing all EEZ industrial expansions to strictly align with GES parameters. Bulgaria is actively executing its updated Marine

Strategy (2022–2027) cycle, managed via the Ministry of Environment and Water (MOEW) to decouple economic growth from marine degradation.

- **Georgia and Türkiye:** Both nations utilize the MSFD's ecosystem-based principles as the benchmark for cumulative impact assessments and transboundary pollution monitoring under the Bucharest Convention framework, facilitating data alignment across the entire sea basin.

The Water Framework Directive (WFD) (Directive 2000/60/EC)

The WFD governs the ecological and chemical status of transboundary river basins and transitional coastal waters, requiring holistic hydrological management rather than fragmented administrative zoning.

- **Romania:** The WFD is instrumental in governing the complex Danube-Black Sea macrosystem. Meeting EU compliance requires extensive, ongoing upgrades to wastewater treatment and agricultural runoff controls to protect downstream marine aquaculture and coastal tourism.
- **Bulgaria:** The Black Sea River Basin Directorate (BSBD) acts as the competent authority, managing coastal water quality metrics and aligning WFD execution directly with national MSFD targets.
- **Georgia and Türkiye:** The WFD provides the structural model for national watershed management policies, establishing standard parameters for monitoring land-sea interactions and riverine pollution loads flowing into the Black Sea.

Industrial effluent and solid waste pollution safeguards

To intercept pollution at its source before it enters the marine food web, the EU deploys a combination of industrial restrictions and circular economy directives:

- **Industrial Emissions Directive (IED / IPPC Directive):** Mandates that large-scale manufacturing, petrochemical, and agricultural facilities situated along major river basins (such as the Danube) adopt **Best Available Techniques (BAT)** to minimize chemical, heavy metal, and thermal effluents. For Romania and Bulgaria, this acts as a critical defensive shield protecting sensitive marine ecosystems from upstream industrial runoff.
- **European Strategy for Plastics in a Circular Economy:** Aims to eliminate the linear "take-make-dispose" model by requiring all plastic packaging on the EU market to be reusable or recyclable by 2030. This strategy is critical for the Black Sea, where low recycling rates historically resulted in severe plastic debris loads flowing down the Danube and regional rivers. Romania and Bulgaria are actively modernizing municipal waste collection under this framework to safeguard the natural capital required for coastal tourism and sustainable fisheries.

Spatial management and clean energy transition

As the competition for marine space intensifies between traditional maritime activities and emerging industries, spatial optimization and fast-tracked decarbonization have become legislative priorities.

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

The MSP Directive provides the legally binding mechanism to allocate marine space efficiently, resolve cross-sectoral conflicts, and ensure co-existence between competing activities—such as offshore renewable installations, commercial shipping lanes, traditional fisheries, and Marine Protected Areas (MPAs).

Table 5 – MSP implementation

Country	MSP Implementation Status	Primary National Focus
Romania	National Maritime Spatial Plan adopted in late 2023.	Delineating offshore wind concessions while protecting the Danube Delta and shipping lanes.
Bulgaria	Maritime Spatial Plan of the Republic of Bulgaria 2021–2035 adopted.	Zoning for specific conservation areas, tourism zones, and offshore energy blocks.
Türkiye	Emerging national MSP agenda under development.	Aligning national coastal zone management with CMA priorities to facilitate regional connectivity.
Georgia	Developing spatial planning frameworks.	Mapping multi-use zones to support strategic connectivity projects like the Black Sea Submarine Cable.

The MSP Directive strictly mandates transboundary coordination. Consequently, Romania and Bulgaria share a formal bilateral obligation to harmonize their spatial maps, ensuring that shipping safety and ecological corridors remain uninterrupted across their contiguous maritime borders.

The Renewable Energy Directive (RED III - Directive (EU) 2023/2413)

RED III is the primary regulatory driver behind the Black Sea's rapid infrastructural pivot toward offshore wind energy, setting an aggressive target to achieve a 42.5% share of renewable energy across the EU by 2030.

A core feature of RED III is the designation of "Renewables Acceleration Areas," which forces member states to streamline and fast-track permitting processes for offshore wind farms without bypassing fundamental environmental impact criteria. Spurred directly by this mandate, Romania enacted its historic *Offshore Wind Energy Law* in 2024, utilizing the 2025–2026 period to execute comprehensive technical studies and officially delineate offshore concession blocks. For Bulgaria, Georgia, and Türkiye, RED III serves as the technical and regulatory baseline for drafting national offshore wind legal frameworks and preparing grid infrastructures for transboundary clean energy transmission.

Biodiversity preservation and ecological restoration

The EU's conservation framework has shifted from passive environmental protection to legally binding, active ecological restoration, reshaping the regulatory landscape for all maritime infrastructure projects.

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

The Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) form the legal backbone of the marine Natura 2000 network. Under the *EU Biodiversity Strategy for 2030*, all member states must legally protect at least 30% of their marine territories, with 10% designated under strict, non-extractive protection.

- Bulgaria: Holds the third-largest marine share in the EU, with its marine Natura 2000 network covering roughly 282,000 hectares. However, this currently accounts for approximately 7.8% of its total marine space, leaving a significant shortfall against the 30% target. Expanding these Specific Conservation Zones (SCZs) introduces strict spatial constraints on the future siting of marine aquaculture and offshore wind farms.
- Romania: Reached a baseline MPA coverage of approximately 21.4% of its marine waters, significantly outperforming the EU average of 13.7%. These zones safeguard benthic habitats and pelagic bird populations along the critical Via Pontica migration flyway, requiring mandatory, rigorous Environmental Impact Assessments (EIAs) for any proposed offshore blue economy developments.
- Georgia and Türkiye: Actively expand their national MPA networks by aligning with the Council of Europe's Emerald Network guidelines, ensuring the transboundary protection of shared Black Sea migratory cetaceans and fish species.

The EU Nature Restoration Regulation

Moving beyond standard conservation, this regulation introduces legally binding mandates to actively rehabilitate degraded ecosystems across at least 20% of the EU's land and sea areas by 2030. Member states are required to submit comprehensive **National Restoration Plans** to the European Commission.

For the Black Sea basin, this framework forces active, state-backed interventions to restore degraded seagrass beds (*Zostera* spp.) and sediment bottoms, which serve as critical blue carbon sinks and fish nurseries. Furthermore, it enforces strict operational restrictions on high-impact industrial activities and destructive fishing gears within restoration zones to accelerate the recovery of vulnerable, iconic Black Sea cetaceans—including the harbor porpoise, common dolphin, and bottlenose dolphin.

Sectoral economic, logistics, and maritime trade transformation

Traditional maritime industries are undergoing sweeping regulatory overhauls designed to eliminate operational waste, enforce decarbonization, and penalize unsustainable extraction.

The Common Fisheries Policy (CFP) (Regulation (EU) 1380/2013)

The CFP is the binding framework used to conserve marine biological resources and manage commercial fishing fleets. For the Black Sea, it enforces science-based Total Allowable Catches (TACs) and strict fishing quotas for key commercial species like turbot and sprat.

- Fleet controls and sustainability: Administered in Romania by the National Agency for Fisheries and Aquaculture (ANPA) and in Bulgaria via the Law on Fisheries and Aquaculture (LFA), the CFP enforces the strict landing obligation (banning discards) and mandates bycatch reduction measures. The formal consultative channel to the European Commission is maintained via the Black Sea Advisory Council (BISAC), with direct

representation from regional Bulgarian and Romanian fishing associations (e.g., BG FISH, EAFBS).

- **Aquaculture transition:** The CFP actively drives financial and regulatory support toward sustainable aquaculture, simplifying licensing to promote modern Recirculating Aquaculture Systems (RAS) and multi-trophic marine farming to alleviate pressure on wild stocks.

The EU Ports Strategy (Adopted March 2026) & Logistics Decarbonization

The EU Ports Strategy, adopted in March 2026, redefines European ports from simple logistics nodes into high-security digital and green-energy hubs. The strategy establishes an *Electrification Action Plan* requiring ports to provide multi-fuel bunkering facilities (such as hydrogen and ammonia) and shore-side electricity for berthing vessels, while implementing strict security screenings against high-risk foreign ownership of critical infrastructure.

For Romania and Bulgaria, this strategy provides the regulatory and financial blueprint to transform major gateways like the Port of Constanța and regional Varna/Burgas networks into zero-emission, highly secure transport hubs. This logistically complements the Port Reception Facilities (PRF) Directive (Directive (EU) 2019/883), which enforces a 100% indirect fee system. Under this system, every commercial vessel calling at a regional port must pay a flat waste fee regardless of the volume delivered. This removes any financial incentive for ship captains to illegally discharge oily bilge water, cargo residues, or garbage into the open waters of the Black Sea.

Scientific research, innovation, and financial frameworks

The deployment of these complex regulatory frameworks is supported by dedicated European financing streams and unified scientific roadmaps that promote pan-European knowledge transfers.

- **Strategic Research and Innovation Agenda (SRIA) for the Black Sea:** Launched as the scientific pillar of the CMA, its 2023 Implementation Plan provides the direct roadmap for translating marine science into economic output. It funds transboundary digital ocean assets—such as the **Digital Twin of the Black Sea**—and fosters specialized educational tracks to develop a modern blue workforce across all four partner nations.
- **Sustainable Blue Economy Partnership (SBEP):** Operating as a massive co-funded initiative under the **Horizon Europe** program, the SBEP pools research investments across 30 countries. It serves as a vital financial bridge for Romania, Bulgaria, Georgia, and Türkiye, funding large-scale, transboundary pilot projects in blue bioresources, marine biotechnology, and climate-resilient coastal infrastructure.
- **EU Mission: Restore our Ocean and Waters by 2030:** A flagship initiative that deploys regional **"Lighthouses"**—collaborative, basin-scale innovation hubs. The *Danube-Black Sea Lighthouse*, officially launched in Bucharest, treats the entire river-to-sea macro-basin as a single system. Romania's formal endorsement of the Mission Charter provides the technical framework and targeted funding required for all four BlueDial nations to pilot nature-based solutions, modernize aquatic governance, and secure the ecological foundation of the shared Black Sea blue economy.

National Blue economy strategies and frameworks

The translation of global, regional, and European Union mandates into actionable maritime policies relies entirely on the domestic legal and strategic architectures of the BlueDial partner countries. A comparative analysis of Romania, Bulgaria, Georgia, and Türkiye reveals a distinct structural divergence in how the blue economy is governed at the national level.

Currently, none of the four countries possess a singular, standalone "Blue Economy Strategy" document. Instead, their maritime governance is structured as a complex matrix of sector-specific laws, strategic blueprints, and regional development programs.

For the EU Member States—Romania and Bulgaria—this matrix is highly mature, driven by the rigid necessity to transpose binding European directives (such as the MSFD and the MSP Directive) into domestic law. Conversely, for Georgia and Türkiye, the blue economy concept is emerging more organically, embedded within broader sectoral frameworks governing transport logistics, tourism expansion, and environmental protection.

The following sections detail how each nation structures its domestic blue economy governance, highlighting key legislative instruments, strategic roadmaps, and structural gaps.

Romania: national strategies and sectoral policies

While Romania lacks a single Blue Economy document, its maritime governance is highly coordinated. 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 economic development with the ecological preservation of the Black Sea and the Danube Delta continuum.

Macro-strategic and environmental frameworks

National Sustainable Development Strategy 2030 (NSDS)

Adopted via Government Decision 877/2018 (reinforced by GD 754/2022), the NSDS is coordinated directly by the Prime Minister's Office. It acts as an umbrella strategy infusing environmental benchmarks across all ministries. Progress is tracked transparently via the "Sustainable Romania" open-data dashboard, monitoring 292 indicators. For the Blue Economy, it prioritizes mitigating land-based marine pollution (specifically agricultural nutrient runoff from the Danube and plastic debris), enforcing science-based fisheries management to curb IUU fishing, and increasing national marine research budgets.

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

Designed to move the nation away from the linear "extract-produce-dispose" model, ROCES 2030 is Romania's definitive roadmap for resource efficiency. Crucially for the Blue Economy, it explicitly links onshore municipal waste management with marine ecological health. By prioritizing the modernization of drinking water and sewage networks to capture microplastics and macro-debris, ROCES 2030 acts as a defensive shield preventing land-based pollution from reaching the Danube-Black Sea macrosystem.

Emergency Ordinance (OUG) no. 71/2010 (Strategy for the Marine Environment)

This is the core legislative engine executing the EU MSFD. It legally binds industrial operations to strict environmental thresholds, requiring continuous evaluation of the Black Sea's qualitative descriptors (noise, contaminants, litter) to actively maintain Good Environmental Status (GES).

Spatial management and clean energy

The Romanian Maritime Spatial Plan (PASM)

Enacted on November 10, 2023 (Government Ordinance no. 97/2023), the PASM establishes a binding legal blueprint over roughly 30,000 square kilometers of maritime territory. Overseen by an inter-ministerial MSP Committee, the plan successfully de-conflicts the Romanian Black Sea by physically separating commercial shipping lanes from military zones, fossil-fuel extraction (Neptun Deep), and traditional fishing corridors. By hardcoding over 21% of marine waters as protected (Natura 2000), it provides extreme spatial clarity for Blue Economy investors.

The Offshore Wind Energy Law (Law no. 121/2024)

Positioning Romania to tap into an estimated 76 to 94 GW of technical wind potential, this law designates the Ministry of Energy as the competent authority to install at least 3 GW of offshore capacity by 2035. Leveraging a Contracts for Difference support scheme to guarantee strike prices, the law strictly aligns with the PASM, ensuring wind perimeters respect shipping lanes and Natura 2000 zones.

Sectoral and regional blue economy policies

- **Multiannual National Strategic Plan for Aquaculture (2021–2030):** Shifts the sector toward climate-resilient practices, providing subsidies for Recirculating Aquaculture Systems (RAS) and integrated multi-trophic aquaculture (like traditional cyprinid polyculture in the Delta) to minimize nutrient discharge.
- **General Master Plan for Transport:** Governs the modernization of the Port of Constanța and the Danube. It focuses heavily on "green shipping"—expanding shore-side electricity, installing advanced waste reception facilities, and shifting freight from road to river.
- **Master Plan for Coastal Protection against Erosion:** An EU-funded initiative utilizing submerged breakwaters and massive beach nourishment to secure Romania's 245km coastline against climate impacts, effectively shielding the highly lucrative coastal tourism sector.
- **Integrated Strategy for the Sustainable Development of the Danube Delta (ISDDD 2030):** Operates through a unique Integrated Territorial Investment (ITI) mechanism, pooling EU funds to modernize sustainable inland fisheries and nature tourism within the UNESCO Biosphere Reserve.

Bulgaria: national strategies and sectoral policies

Bulgaria's governance framework is similarly driven by EU obligations, though blue economy priorities remain somewhat fragmented across sectoral strategies governing tourism, transport, and regional development without a dedicated mechanism for cross-sectoral coordination.

Spatial and environmental governance

Maritime Spatial Plan 2021–2035 (MSP)

Adopted in March 2023, the MSP is the primary national instrument integrating Blue Economy uses. It organizes maritime space into four zones: Prohibition, Specific Conservation, Multifunctional, and Integrated Management. Strategic Goal 2 specifically targets building a diversified Blue Economy. However, a key legislative gap remains: the overarching *Law on*

Maritime Spaces, Internal Waterways and Ports (MSIWPA) does not comprehensively specify responsibilities for monitoring MSP application.

Marine Strategy of the Republic of Bulgaria 2022–2027

Developed by the Black Sea River Basin Directorate (BSBD) and the Institute of Oceanology, this strategy is the second-cycle MSFD update. Assessments show Bulgarian waters have not yet achieved GES for most descriptors, struggling with eutrophication and marine litter. The implementation of its Programme of Measures is uneven; measures requiring cross-sectoral coordination or dedicated funding (like cetacean monitoring) lag behind standard regulatory routines.

Transport, tourism, and industrial policies

Integrated Transport Strategy 2030 (NITS 2030)

This is the principal planning framework for Bulgaria's port system. It identifies severe structural constraints: outdated quay infrastructure, insufficient approach depths, aging portal cranes, and urban-embedded terminals lacking rail connections. The strategy prioritizes port modernization, Danube channel maintenance, and Vessel Traffic Management and Information System (VTMIS) upgrades, though it lacks a dedicated financing roadmap tied specifically to Blue Economy objectives.

Additional key strategies:

- **National Tourism Strategy 2014–2030:** Governs coastal tourism (51% of Blue Economy GVA). The associated Action Plan expired in 2021, and a new strategy is currently in preparation.
- **Innovation Strategy for Smart Specialisation (RIS3) 2021–2027:** Blue economy activities (marine biotechnology, low-emission transport) are explicitly referenced as subareas within three thematic pillars, though the Blue Economy is not named as a standalone priority sector.
- **National Concept for Spatial and Regional Development 2026–2040:** One of the few documents explicitly using the term "Blue Economy," promoting integrated territorial development along the Black Sea coast.

Legislative framework gaps

Bulgarian Blue Economy sectors are governed by primary laws such as the *Tourism Act*, the *Law on Fisheries and Aquaculture (LFA)*, and the foundational *Commercial Shipping Code (CSC)*, which incorporates IMO conventions into national law. However, significant gaps exist:

- As of 2026, Bulgaria has not designated offshore wind energy zones. The country is preparing a national plan for the designation of priority wind energy areas in line with the Renewable Energy Sources Act and the requirements of RED III, but no offshore-specific zones have yet been formally adopted.
- The Long-Term Strategy for Climate Change Mitigation to 2050 identifies maritime transport decarbonization pathways (e.g. biofuels and electrification) but does not establish a framework for offshore wind development or spatial planning for offshore renewable energy, leaving a critical gap in the renewable energy transition

Georgia: sectoral policies and emerging frameworks

Unlike the EU Member States, Georgia does not have a formal blue economy policy domain, maritime development strategy, or integrated coastal framework. Blue economy development remains implicit and indirect, shaped through traditional, sector-based policies addressing transport, tourism, and environmental protection.

Sectoral governance and tourism modernization

Tourism Strategy and the Law on Tourism

Tourism is a highly developed blue economy sector. The *Tourism Strategy 2025* focused heavily on volume-based growth in international arrivals, addressing coastal tourism mainly through destination development rather than integrated spatial planning. However, Georgia is transitioning. A new *Tourism Strategy 2035* is in development, aiming to shift toward higher value-added, sustainable models. This transition is supported by the recent **Law of Georgia on Tourism**, which establishes a comprehensive legal basis for governance, introduces Destination Management Organizations (DMOs), and aligns consumer protection with European standards.

Transport and Infrastructure

Maritime transport and logistics are guided by national transport frameworks emphasizing port modernization, safety, and Georgia's role as a transit corridor between Europe and Asia. While economically vital, their connection with environmental sustainability and coastal governance remains indirect.

Environmental and maritime legislation

The legal foundation for maritime governance is established by the **Law of Georgia on Maritime Space** (defining jurisdiction over EEZs and territorial seas) and the **Maritime Code of Georgia** (regulating shipping, ports, and safety).

Environmental governance is regulated through the **Environmental Assessment Code**, ensuring major infrastructure projects undergo EIA and SEA scrutiny. A significant recent reform is the **Law of Georgia on Water Resources Management**, introducing integrated basin management principles critical for controlling land-based pollution flows into the Black Sea.

While the *Code of Georgia on Spatial Planning* provides a legal basis to include the territorial sea, Georgia currently lacks a dedicated maritime spatial planning framework equivalent to the EU MSP Directive to coordinate competing uses. However, alignment with the CMA and strategic projects like the **Black Sea Submarine Cable Project** are driving gradual institutional integration.

Türkiye: regional integration and the emerging MSP Agenda

Similar to Georgia, Türkiye addresses blue economy priorities through a wide, multi-sectoral policy base rather than a single document. However, its massive maritime scale and highly developed logistics and tourism sectors drive a more formalized approach to regional planning and marine spatial integration.

Macro-Economic and regional frameworks

Twelfth Development Plan 2024-2028

This overarching framework includes priorities relevant to green transformation, logistics, competitiveness, and climate resilience. While not labeled as a "Blue Economy" package, it directly impacts ports, coastal cities, and marine environmental protection.

Eastern Black Sea Regional Development Plan (2024-2028)

Developed by the regional development agency (DOKA), this plan explicitly highlights the Blue Economy's importance. It emphasizes aquaculture as a high-potential sector, noting that sustainability is the primary concern, requiring interventions for overfishing, pollution, cold-chain capacity, and monitoring gaps. It also targets investments in coastal tourism, specifically sailing and yachting, noting that cross-border Black Sea synergies are required to build necessary shelter infrastructure every 40-50 km.

2053 Transport and Logistics Master Plan

Central to Türkiye's blue economy competitiveness, this plan aims to strengthen the country's role as a global logistics hub, prioritizing port modernization, hinterland connections, and rail-port integration.

Legal and spatial frameworks

Türkiye's maritime legal framework is robust, anchored by the **Fisheries Law No. 1380** (regulating capture fisheries, licensing, and fishing bans), the **Coastal Law No. 3621** (regulating land-sea interactions and coastal infrastructure), and the **Environmental Law No. 2872** (providing the basis for marine pollution control and EIA rules).

The Emerging Marine Spatial Planning (MSP) Agenda

The most direct step toward integrated Blue Economy governance in Türkiye is its emerging MSP agenda. Described through the *Sustainable Blue Economy Plan*, this approach aims to reduce conflicts, encourage investment, and identify multi-use opportunities.

Crucially, while national MSP legislation has not yet been fully adopted, a major institutional milestone was achieved with the establishment of the **Marine Spatial Planning Coordination Committee** via Presidential Decree 2025/12 on July 24, 2025. Headed by the Vice President and comprising eight key ministries (including Environment, Energy, Tourism, and Transport), this committee represents a decisive move toward institutionalizing spatial planning and clarifying the legal environment for cross-border Blue Economy investments.

Alignment with the Common Maritime Agenda for the Black Sea

Endorsed in 2019, the Common Maritime Agenda (CMA) for the Black Sea serves as the defining regional framework for maritime cooperation. It establishes three overarching goals: protecting marine ecosystems, driving a competitive Blue Economy, and fostering investment.

Across the BlueDial partner countries, alignment with the CMA is achieved through vastly different governance mechanisms. Romania and Bulgaria leverage the CMA to channel EU structural funds and enforce binding European directives. Conversely, Georgia and Türkiye align through regional development projects, sectoral modernizations, and project-based cooperation. While the objectives are shared, the depth of institutional integration and practical implementation varies significantly.

Goal 1: Healthy Marine and Coastal Ecosystems

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

The protection of the Black Sea ecosystem represents the strongest area of formal policy alignment across all four nations, though practical implementation is frequently hindered by transboundary dependencies and monitoring gaps.

- **Romania (strong alignment):** Romania translates this goal into strict domestic mandates through its National Sustainable Development Strategy 2030 (codifying SDG 14). Marine plastic pollution is targeted at the source via the ROCES 2030 circular economy strategy, preventing Danube River runoff. Biodiversity is actively preserved through the Maritime Spatial Plan (safeguarding Natura 2000 zones) and habitat restoration projects under the Danube-Black Sea Lighthouse initiative.
- **Bulgaria (moderate-strong alignment):** Formal alignment is robust, driven by the Marine Strategy 2022–2027 and the designation of a massive marine Natura 2000 network (282,000 ha). However, a significant practical implementation gap exists: Good Environmental Status (GES) has not yet been achieved for most descriptors, with the coast still facing persistent pressures from eutrophication, marine litter, and invasive alien species.
- **Türkiye (moderate alignment):** Türkiye's environmental legislation, Zero Waste initiatives, and fisheries management policies are broadly compatible with this CMA goal. The country possesses strong marine monitoring capacity via its universities. The primary implementation gaps involve the need for integrated land-sea pollution management and the lack of shared, basin-wide Black Sea monitoring datasets.
- **Georgia (partial alignment):** Georgia's environmental strategies and monitoring systems relate well to CMA sustainability priorities. However, this alignment remains implicit; marine ecosystem protection is embedded within broader national environmental frameworks rather than a dedicated coastal or Blue Economy agenda.

Goal 2: Competitive, Innovative, and Sustainable Blue Economy

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

Alignment under this goal highlights the divergence in national economic priorities, ranging from offshore renewable energy expansion to the modernization of traditional port logistics.

- **Romania:** Acts as a regional leader in adopting emerging sectors. The Smart Specialization Strategy (RIS3) funnels regional funds into marine biotechnology and green shipbuilding. Concurrently, the new Offshore Wind Energy Law directly fulfils the CMA's call for clean marine energy, while the General Master Plan for Transport drives the decarbonization of the Port of Constanța and shifts freight to inland waterways.
- **Bulgaria:** Demonstrates moderate to strong alignment in established sectors (maritime transport, traditional fisheries, and coastal tourism). However, alignment is weak in emerging sectors. The incomplete regulatory framework and the absence of designated marine areas for offshore renewable energy continue to hinder the development of the

sector. Although Bulgaria has a well-developed marine research base, the commercialization of research results and their uptake by industry remain limited.

- **Türkiye:** Possesses immense sectoral capacity in ports, logistics, aquaculture, and shipbuilding, making it highly competitive. The 2053 Transport and Logistics Master Plan aligns perfectly with CMA connectivity goals. To bridge existing innovation gaps, regional development plans (such as in the TR90 Eastern Black Sea region) are actively recommending the creation of blue business clusters and blue skills hubs to elevate value-added processing.
- **Georgia:** Strongest alignment is found in its role as a Black Sea transit and connectivity hub. Tourism policy is actively transitioning toward sustainable, higher-value coastal destination development. Research cooperation is fostered through the CMA's Strategic Research and Innovation Agenda (SRIA), though the lack of an integrated maritime spatial planning system limits cross-sectoral synergy.

Goal 3: Fostering Investment in the Black Sea Blue Economy

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

The availability of capital is generally high across the basin, but the capacity to structure "bankable" cross-border projects remains a universal challenge.

- **Romania:** Successfully utilizes the CMA framework to unlock EU capital. The Integrated Territorial Investment (ITI) mechanism for the Danube Delta pools fragmented European funds into a single regional pipeline. Furthermore, the National Recovery and Resilience Plan (PNRR) earmarks massive investments for water management, turning environmental compliance into a bankable asset.
- **Bulgaria:** Accesses a broad range of funding instruments, including EMFAF, Horizon Europe, and Interreg NEXT Black Sea Basin. However, the absence of a dedicated Blue Economy investment roadmap and fragmented inter-ministerial coordination limits the strategic prioritization of these funds.
- **Türkiye:** Investment is heavily supported by regional development agencies (DOKA), IPARD, investment incentives, and private capital in ports and aquaculture. The primary gap is not a lack of funds, but a deficit in project preparation capacity—specifically the need for bankable feasibility studies and blended finance structuring to attract international capital.
- **Georgia:** Investment alignment is primarily project-based and driven by donor-supported regional cooperation platforms. The financial architecture for the Blue Economy is not yet institutionalized at the national level.

Table 6: CMA alignment synthesis

Country	Goal 1: Ecosystems	Goal 2: Competitive Economy	Goal 3: Investment	Primary Governance Gap
Romania	Strong	Strong	Strong	Bureaucratic bottlenecks in permitting

Bulgaria	Moderate-Strong	Moderate	Weak-Moderate	There is no unified Blue Economy strategy
Türkiye	Moderate	Moderate-Strong	Moderate	Need for cross-border bankable project pipelines
Georgia	Partial	Partial	Partial	Absence of an integrated spatial planning system

Regional and local strategies

While national strategic blueprints and supranational directives establish the overarching legal framework for the blue economy, its actual implementation and operationalization occur at regional, county, and municipal levels. Sub-national authorities must directly manage competing spatial demands, site-specific environmental vulnerabilities, and local community livelihoods. Across the Black Sea basin, the translation of policy into practice varies from highly structured, bifurcated ecological zoning models to decentralized sectoral frameworks.

Romania: a deeply bifurcated coastal governance model

Romania's 245-kilometer Black Sea coastline is administratively and ecologically divided into two highly distinct management zones. Each zone employs tailored regional frameworks and spatial planning instruments to balance economic exploitation with ecosystem preservation.

The Northern Sector: Danube Delta Biosphere Reserve

The Northern coastal sector is characterized by a dynamic river-sea transition zone where freshwater river networks merge with the marine environment. Governed primarily under **Law no. 82/1993**, this UNESCO Biosphere Reserve is managed by the **Danube Delta Biosphere Reserve Authority (DDBRA)**, which holds supreme administrative veto power over regional development.

- **Regulatory regime:** High-impact maritime operations, heavy industrial zoning, and mass tourism developments are legally prohibited.
- **Strategic directives:** Focuses on high-value, low-impact sustainability. Local rules mandate strict science-based catch quotas, seasonal fishing bans on endangered species (e.g., Danube sturgeon), and strict carrying-capacity limits for ecotourism vessels.
- **Financial delivery:** Leverages the **Integrated Territorial Investment (ITI) Danube Delta mechanism** to pool European structural funds. This financial pipeline directly backs small-scale fleet modernization, municipal waste upgrades, and community-led aquaculture ventures.

The Southern Sector: industrialized and urbanized littoral

Stretching from Cape Midia to the Bulgarian border at Vama Veche, the Southern sector serves as the high-output economic engine of Romania's maritime economy. This zone is characterized by dense urbanization, intense commercial shipping lanes feeding into the Port of Constanța, and massive tourist infrastructure.

Historically guided by the foundational Emergency Ordinance (OUG) no. 202/2002 on Integrated Coastal Zone Management (ICZM), this sector's governance was recently modernized through a landmark legislative update. In August 2025, the Romanian Government adopted **Government Decision (HG) No. 689/2025**, which officially approves both the **National Strategy for Integrated Coastal Zone Management** and the **Integrated Coastal Zone Management Plan**.

This 2025 framework serves as the definitive operational blueprint for local authorities in Constanța County to manage the intense spatial conflicts between economic growth and environmental protection. Local strategies within this modernized framework focus intensely on three primary management objectives:

1. **Regulating urban sprawl and mass tourism:** The 2025 Management Plan enforces strict zoning regulations to prevent the unchecked expansion of mass tourism real estate—particularly in vulnerable resorts like Mamaia and Eforie—ensuring that physical developments do not destroy the remaining natural coastal buffer zones, dunes, and cultural heritage sites.
2. **Mitigating land-sea interactions:** 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 petro-chemical platforms. This is essential to prevent nutrient runoff and chemical discharges from causing eutrophication in the nearby coastal waters.
3. **Seamless terrestrial-marine grid integration:** Local municipal urban development plans (PUG) must now integrate directly with the national spatial frameworks, specifically the *Maritime Spatial Plan (GO 97/2023)* and the *Offshore Wind Energy Law (Law no. 121/2024)*. As Romania begins to develop offshore wind farms and expand commercial shipping lanes, the new 2025 coastal strategy ensures that terrestrial infrastructure—such as port grid connections and logistics hubs—is 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. Guided by the 2025 Coastal Zone Strategy, they oversee the ongoing multi-million-euro coastal erosion protection projects, ensuring that the intense economic productivity of the Southern littoral does not irreversibly degrade the natural marine capital that sustains it.

Bulgaria: multi-tiered regional frameworks and smart specialization

Bulgaria's sub-national maritime landscape operates via a formal hierarchical system, moving from national spatial concepts down to specialized municipal portfolios and community-led strategies.

The overarching national spatial reference

At the peak of the sub-national hierarchy is the **National Concept for Spatial and Regional Development 2026–2040 (NCRSD)**. This document designates the Black Sea coast as a national priority zone and explicitly identifies the Blue Economy as its core specialization axis. It establishes the **"Portal Varna — Portal Burgas" Eastern Urban Axis**, focusing local public investments toward clean technologies, circular economy integration, and marine biotechnology.

Regional Level: Integrated Territorial Strategies (ITS)

The Bulgarian coast is divided into two planning regions, each executing distinct maritime operational approaches approved via Council of Ministers Decision in late 2022:

- **South-East Planning Region (ITS-SE):** Explicitly hardcodes the "Blue Economy" as a dedicated policy objective (Specific Goal 1.2). This framework focuses on reducing carbon emissions from vessels, expanding circular economy models across shipping industries, and managing the Burgas district's massive coastal tourism portfolio (which accounts for over 40% of the nation's mass tourism). It leverages the strategic advantage of the Port of Burgas being a core node in the Trans-European Transport Network (TEN-T).
- **North-East Planning Region (ITS-NE):** Driven by the maritime vision *"Open to the Black Sea and the World."* This regional framework prioritizes a sea-related economy by leveraging Varna's deep academic and scientific assets—including the Nikola Vaptsarov Naval Academy (NVNA), Technical University-Varna, and the Institute of Oceanology (IO-BAS). However, the strategy candidly flags a structural vulnerability: the region remains a modest innovator within the EU, suffering from declining commercialization rates of marine research.

Local Level: Municipal Integrated Development Plans (MIDP)

All 14 Bulgarian coastal municipalities operate under MIDPs running through 2027, though the depth of their blue economy integration varies dramatically:

Table 6: Bulgarian municipalities strategies

Municipality	Strategic Instrument & Governance Innovations	Core Project Portfolios & Sectors
Burgas	• Blue Growth Strategy 2024–2030 • Dedicated Maritime Affairs Directorate • Public GIS monitoring (plan.smartburgas.eu)	Dedicated Blue Economy implementation measures; multi-sector tracking; integrated climate-energy mapping.
Varna	• Standard MIDP framework • Sector-specific monitoring models	Modernization of the fishing and marine sports port at Sveti Konstantin i Elena; waterfront regeneration; fleet decarbonization.
Nesebar	• Integrated MIDP & UNESCO Heritage Plan	Balancing historical preservation with intense coastal mass tourism and marine Natura 2000 mandates.

Balchik	• Anchored multi-measure marina framework	Investment in nautical/sailing tourism infrastructure and coastal eco-tourism corridors.
Pomorie	• Niche specialization framework	Targeted development of micro-sectors: salt production and specialized coastal health/balneotherapy tourism.

Community level, port Logistics, and innovation hubs

- **Fisheries Local Action Groups (FLAGs):** The coastal strip is covered by 7 active maritime FLAGs funded via the European Maritime, Fisheries and Aquaculture Fund (EMFAF). These groups manage a combined Community-Led Local Development (CLLD) budget of over €24.2 million, serving as the primary mechanism for translating national fisheries policies into local public-private partnerships.
- **Bulgarian Ports Infrastructure Company (BPIC):** Manages state infrastructure at Varna and Burgas. Its updated Annual Programme implements the EU Emissions Trading System (ETS) maritime extension, funding digital port operations, shore-side electrification, and smart traffic management.
- **EIT Water Black Sea Regional Hub:** Hosted by Marine Cluster Bulgaria, this hub provides regional businesses, tech start-ups, and academic researchers with direct access to the European Institute of Innovation and Technology's pan-European funding, knowledge-transfer, and venture-capital networks.

Key sub-national governance gaps in Bulgaria

Despite this dense framework, several systemic gaps hinder regional efficiency:

1. **Absence of intermediate coordination:** There is no dedicated regional Blue Economy coordination mechanism below the macro-level Integrated Territorial Strategies, leaving cross-municipal projects fragmented.
2. **Asymmetric strategy adoption:** Outside of Burgas, no other coastal municipality possesses a standalone Blue Economy strategic plan or a dedicated maritime administrative department.

Georgia: decentralized sectoral realities and port-city dynamics

At the sub-national level, Georgia's coastal Blue Economy is concentrated across three maritime administrative regions: **Adjara, Guria, and Samegrelo-Zemo Svaneti**.

Regional sectoral focus

Unlike the structured spatial models of Romania and Bulgaria, Georgian municipalities do not frame local policies explicitly around a "Blue Economy" nomenclature. Coastal and maritime issues are managed implicitly through decentralized regional infrastructure and destination management plans.

- **The Autonomous Republic of Adjara:** Serves as the high-intensity cluster for Georgia's coastal economy. Local governance relies heavily on specialized regional tourism institutions and municipal development bodies that manage the intense concentration of seaside hospitality, maritime shipping, and urban expansion in Batumi.

- **Guria and Samegrelo-Zemo Svaneti:** Local authorities focus primarily on basic municipal infrastructure, transit corridor connectivity (such as the expansion of the Port of Poti), and localized agricultural and small-scale nearshore fisheries governance.

Local Institutional Transitions and Gaps

A significant regional governance innovation is the introduction of **Destination Management Organizations (DMOs)** under the recent *Law of Georgia on Tourism*. These bodies facilitate structured public-private dialogues to improve quality-of-service and promote environmental sustainability at the municipal level. Furthermore, the transposition of the *Law on Water Resources Management* forces coastal municipalities to play a more active role in monitoring river-mouth waste dumping and urban wastewater outflows.

However, the primary structural gap in Georgia's sub-national framework is the **complete absence of localized marine spatial coordination**. Because the country lacks a localized maritime spatial planning system, individual coastal municipalities possess limited legal power to format or regulate offshore activities. Consequently, critical port-city interactions, the expansion of maritime transport hubs, and the development of nearby coastal tourism zones continue to operate via disconnected sectoral trajectories rather than a single, unified maritime policy framework.

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

The successful governance of the blue economy across the Black Sea basin relies entirely on the principle of coherence—ensuring that high-level supranational priorities (EU Directives and the CMA) are accurately translated into national legislation and effectively executed by regional and local authorities. Because maritime spaces are highly dynamic and interconnected, fragmented policymaking inevitably leads to spatial conflicts, environmental degradation, and the loss of major funding opportunities.

Across Romania, Bulgaria, Georgia, and Türkiye, the overarching pattern of alignment is highly consistent: formal policy integration at the national level is comparatively strong, but practical, cross-sectoral implementation at the local level remains structurally weak.

This coherence gap can be analyzed across three distinct dimensions: vertical coherence (from supranational to local), horizontal coherence (across different sectoral ministries), and temporal coherence (the lag between strategy adoption and on-the-ground action).

Vertical coherence: the implementation drop-off

Vertical coherence measures how successfully high-level mandates penetrate down to the municipal level where physical development occurs.

The EU Member States (Romania & Bulgaria)

Both nations exhibit strong vertical alignment on paper, driven by the strict transposition of EU mandates. For example, Romania successfully transposed the EU Maritime Spatial Planning (MSP) Directive via Law no. 88/2017 and Government Ordinance no. 97/2023, while Bulgaria was among the majority of EU states to adopt its MSP on time. Both nations have transposed the Marine Strategy Framework Directive (MSFD) and actively enforce the Natura 2000 network.

However, a severe vertical "drop-off" occurs at the local implementation tier:

- **Romania:** While overarching strategies like ROCES 2030 (Circular Economy) or the Smart Specialization Strategy (RIS3) perfectly mirror EU Green Deal and CMA targets, local execution is frequently hindered by limited administrative capacity. Municipalities often lack the technical expertise to execute complex, multi-sectoral Blue Economy projects, leaving a gap between national laws and local realities.
- **Bulgaria:** The planning hierarchy carries the *language* of Blue Economy downwards through the National Concept for Spatial and Regional Development (NCRSD) to the Integrated Territorial Strategies (ITS), but it fails to attach funded investment obligations or monitoring requirements. With the notable exception of **Burgas** (which established a dedicated Blue Economy framework and monitoring platform), most coastal municipalities continue to address maritime sectors through fragmented, traditional planning instruments.

The Non-EU Partners (Georgia & Türkiye)

For Georgia and Türkiye, EU frameworks and the CMA act as vital external benchmarks rather than binding statutory obligations.

- **Georgia:** Coherence is partial. While national laws (e.g., the Law on Maritime Space, the Law on Water Resources Management, and the Law on Tourism) align with modern sustainability principles, regional and local authorities in coastal areas like Adjara engage in implementation solely through sectoral lenses (primarily tourism and basic infrastructure). Georgia lacks an integrated national Blue Economy pipeline that connects local actions to a unified maritime vision.
- **Türkiye:** Demonstrates a highly capable but traditionally siloed vertical structure. However, Türkiye is increasingly utilizing its Regional Development Agencies—such as **DOKA** in the TR90 Eastern Black Sea region—as the primary mechanism to drive CMA priorities down to the local level. DOKA's Blue Economy result-oriented programs actively build local capacity for aquaculture, coastal tourism, and marine innovation, acting as a crucial bridge between Ankara's national development goals and local Black Sea communities.

Horizontal coherence: the challenge of sectoral fragmentation

The most pervasive barrier to blue economy development across all four partner countries is horizontal fragmentation. The blue economy is inherently multi-sectoral, yet its governance remains dispersed across multiple, often competing, ministries and agencies (e.g., transport, environment, agriculture, tourism, energy, and defense).

- **Romania and Bulgaria:** In both nations, responsibilities are heavily fragmented. Bulgaria's governance spans at least nine different ministries without a permanent integrating mechanism beyond the temporary consultative councils used to draft the MSP. Consequently, environmental preservation goals often clash administratively with transport or energy expansion targets, complicating the delivery of ecosystem-based management.
- **Georgia:** The absence of a formalized Maritime Spatial Planning system prevents the resolution of cross-sectoral conflicts. Tourism development, port expansion, and environmental protection operate in administrative silos, limiting the potential for multi-use synergies (e.g., co-locating marine aquaculture with offshore energy).
- **Türkiye:** In a landmark step toward resolving this exact bottleneck, Türkiye recently established the **Marine Spatial Planning Coordination Committee** (via Presidential Decree 2025/12 in July 2025). Headed directly by the Vice President and uniting eight key ministries, this body represents the basin's most aggressive recent move to

institutionalize horizontal coordination, drastically clarifying the regulatory environment for complex, multi-sector investments.

Temporal and strategic coherence: the implementation lag

The final dimension of coherence is temporal—the lag between the adoption of a strategic blueprint and its actual, funded execution. Across the region, strategic ambitions frequently outpace operational realities.

This is highly visible in **Bulgaria**, where a structural lag persists between strategy and action. For example, the National Tourism Strategy has operated without an active Action Plan since 2021, while progress in establishing a regulatory and planning framework for offshore renewable energy has been slowed down, reflecting the need to balance environmental, economic and societal considerations. Similarly, while research hubs like the Institute of Oceanology (IO-BAS) excel in EU-funded R&I networks, the commercialization pathway for research results remains underdeveloped, limiting their translation into commercial applications.

In **Romania**, temporal coherence is generally stronger due to the strict funding deadlines tied to the National Recovery and Resilience Plan (NRRP) and the Horizon Europe Sustainable Blue Economy Partnership. By anchoring national research and development tightly to pan-European funding cycles, Romania forces a tighter timeline on transitioning research (like marine biotechnology) into commercial deployment.

Summary: implications for regional interventions

The legal and strategic mapping of Romania, Bulgaria, Georgia, and Türkiye reveals that the primary challenge for the Blue Economy is no longer a lack of policy—it is a lack of **integrated execution**.

To maximize alignment with the Common Maritime Agenda, future transboundary initiatives must focus less on drafting new high-level strategies and more on building an "integrating layer."

This involves:

1. **Capacity building at the municipal level:** Equipping local coastal authorities with the technical expertise to manage complex land-sea interactions and access blended finance.
2. **Institutionalizing cross-sectoral committees:** Moving beyond temporary working groups to establish permanent, multi-ministerial Blue Economy task forces (following Türkiye's recent MSP Committee model).
3. **Developing "bankable" project pipelines:** Translating abstract environmental and spatial regulations into clear, de-risked investment portfolios to attract private and European capital to the Black Sea coast.

Target group mapping and sector analysis

The Black Sea holds immense strategic and economic value as a hub linking Europe, Asia, and the Middle East, yet its Blue Economy—encompassing fisheries, tourism, transport, renewable energy, and marine biotechnology—requires coordinated efforts to reach its full sustainable potential. Transitioning from high-level policy frameworks, such as the Common Maritime Agenda (CMA) for the Black Sea, to actionable practice requires a granular understanding of the complex network of stakeholders operating across the region (Salihoglu et al., 2024).

Within the framework of the BlueDial project, target group mapping serves as the critical first step to systematically identify the key players driving economic value, as well as those most

vulnerable to environmental degradation and regulatory shifts. By isolating these groups—spanning government bodies, private industry, academia, and civil society—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 across Romania, Bulgaria, Georgia, and Türkiye is essential to diagnose the current health, shared structural challenges, and future potential of the region's maritime industries.

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. 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. Analysing 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, directly employing over 65,000 people and generating 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. Port operations—primarily driven by the massive multipurpose Port of Constanța—account for a large share of the sector's economic value. However, 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.

Sectoral GVA and employment distribution:

- Shipbuilding and repair represent the single largest contributor, accounting for 32.4% of the total GVA.
- Living resources (fisheries and aquaculture) follow closely at 27.2%. Together, these two sectors generate nearly 60% of the blue economy's direct economic value.
- Port activities and logistics comprise 17.4% of the GVA.
- Coastal tourism holds a comparable share at 16.7%.
- Maritime transport accounts for a surprisingly modest 4.4% of direct GVA, with the remaining fraction (approx. 1.9%) allocated to emerging or minor sectors.

Over a three-year period, the proportional weight of the blue economy within Romania's broader national framework has shown minor volatility (peaking at 0.91% in 2021 before contracting to 0.84% in 2022). This highlights a sector that, while functionally critical, struggles to significantly expand its direct statistical footprint relative to the rapid growth of Romania's wider onshore economy, reinforcing the need for targeted investments.

According to EU Blue Economy Observatory data, Bulgaria's established Blue Economy sectors generated a combined GVA of approximately €984 million in 2022, with total employment of approximately 53,000 full-time equivalents (FTE). These figures represent a significant recovery from the COVID-19 contraction of 2020 and are broadly consistent with the long-term trend of nominal GVA growth alongside modest employment decline observed since 2009.

Unlike Romania's heavy industrial focus, Bulgaria's blue economy is heavily concentrated in leisure and tourism:

- Coastal and maritime tourism: Accounts for 50.9% of sector GVA (€500.8 million) and 60.6% of FTE employment (32,100 jobs).
- Marine living resources: The second largest group by GVA at 17.5% (€172.0 million) and 21.6% of employment.
- Shipbuilding and ship repair: Contributes 13.3% of GVA (€131.0 million).
- Port activities and logistics: Accounts for 11.1% of GVA (€109.4 million).
- Maritime transport and shipping: Represents 5.3% of GVA.
- Marine non-living resources: Contributes approximately 1.8% of GVA.

Emerging sectors—including marine renewable energy, marine biotechnology, ocean monitoring, and blue carbon—currently have no systematic economic quantification in Bulgaria. However, the pre-pandemic baseline established by the World Bank in 2018 highlighted that Bulgaria already placed above the EU-28 average for blue economy employment share, driven largely by its coastal tourism dominance.

Georgia is a vital maritime gateway with a 315-kilometer coastline along the Black Sea, functioning as a critical logistical bridge between Asia and Europe (Sekhniashvili, n.d.). Target group mapping in Georgia reveals that port authorities, transport operators, and coastal municipalities are the primary drivers of the blue economy.

- **Ports and maritime transport:** The maritime and port sectors are of paramount economic significance to Georgia, traditionally contributing substantial value to the national GDP and acting as the backbone of the country's blue economy (Papadaki, n.d.). Modernizing port infrastructure to handle growing trade volumes remains a central investment priority.
- **Coastal tourism and aquaculture:** The marine and coastal tourism sectors are experiencing rapid development, alongside a noticeable increase in marine aquaculture cultivation (Papadaki, n.d.).

However, Georgia faces distinct structural challenges, particularly regarding the impacts of climate change—such as rising sea levels, increased frequency of extreme weather events, and rising water temperatures—which directly threaten vulnerable coastal infrastructure and emerging aquaculture operations (Sekhniashvili, n.d.). Collaborative platforms and multi-actor forums are actively being utilized to help Georgian scientists, industry leaders, and local communities prioritize these issues and co-create sustainable innovation pathways (Papadaki, n.d.).

Türkiye's blue economy is highly diversified and operationalizes across a vast and strategic coastline. Established sectors include coastal and maritime tourism, maritime transport, ports and logistics, fisheries and aquaculture, shipbuilding, repair, maritime services, and marine education. Furthermore, the country recognizes that environmental protection, ecosystem

management, and coastal resilience are not merely public functions, but the fundamental enabling conditions for all other sectors to thrive (Abukalloub, n.d.).

Türkiye's unique transcontinental position provides significant opportunities to transition toward a sustainable blue economy model that aligns with global Sustainable Development Goals (SDGs), despite historically fragmented institutional structures (Abukalloub, n.d.). Emerging sectors such as marine renewable energy, marine biotechnology, blue carbon, marine data, algae production, and circular economy initiatives carry immense potential to create new economic value when linked to regional research and venture capital.

Table 7 - Target groups and sector priorities in Türkiye's blue economy

Sector		Main Target Groups	Key Opportunities	Priority Gaps
Coastal & Maritime Tourism		Tourism municipalities, marina/cruise operators, community entrepreneurs, SMEs, DMOs,	Blue routes, cruise marina, sports, gastronomy, coastal heritage	Seasonality, waste, carrying capacity, destination governance
Maritime Transport & Ports		Port operators, logistics firms, exporters, shipping agencies, local governments	Green ports, smart logistics, Black Sea corridors, port-city services	Hinterland links, emissions, digital systems, resilience
Fisheries & Aquaculture		Fishers, aquaculture firms, processors, cooperatives, exporters, research institutions	Turkish salmon, processing, cold chain, certification, export growth	Feed costs, monitoring, site conflicts, high value-added processing
Marine Environment		Environmental authorities, municipalities, ports, NGOs, universities, communities	Marine litter reduction, joint monitoring, citizen science, resilience	Fragmented data, land-based pollution, enforcement, behavior change
Emerging Blue Sectors		Researchers, start-ups, technoparks, investors, ports, SMEs	Marine biotech, algae, digital ocean, robotics, renewable energy services	Commercialization, test sites, venture finance, regulatory clarity

Ultimately, mapping these distinct sectoral realities and target groups across Romania, Bulgaria, Georgia, and Türkiye provides the foundation necessary for the BlueDial project to deploy targeted interventions, ensuring that regional economic growth is intrinsically linked to the health and restoration of the Black Sea.

Sector analysis

Ports, related facilities and logistics networks

The maritime transport, ports, and logistics sector serves as the physical backbone of the Black Sea's blue economy. For Romania, Bulgaria, Türkiye, and Georgia, strategic coastal positioning offers critical connectivity between European, Caucasian, and Asian markets.

As global supply chains restructure and regional geopolitical dynamics shift, these nations are heavily investing in port expansion, green infrastructure, and multimodal hinterland connections. However, the transition from traditional cargo handling to sustainable, low-emission logistics hubs reveals significant disparities in infrastructure maturity, digital integration, and environmental planning across the basin.



Figure 1 - Black Sea shipping and trade corridors. Source: Bloomberg / Bloomberg via Getty Images

Romania: The Transshipment Anchor

Romania's maritime logistics are dominated by the **Port of Constanța** — the largest seaport in the Black Sea and a critical gateway for Central and Eastern Europe. Integrated into the TRACECA (Transport Corridor Europe-Caucasus-Asia) network, Constanța serves as a primary node for Euro-Asian trade.

The port's specialized infrastructure is divided into four main operational sectors:

- **Container Terminals:** Features advanced gantry cranes for rapid turnaround. The Constanța South terminal operates as a Free Zone, offering tax and customs incentives.
- **Bulk Cargo Terminals:** Engineered for the high-volume transit of agricultural grains, ores, and fertilizers.
- **General Cargo Terminals:** Manages breakbulk, project cargo, and Ro-Ro (roll-on/roll-off) logistics.
- **Passenger Terminal:** Modernized to support maritime tourism, regional ferries, and international cruise traffic.

Following a historic peak of 92.69 million tonnes in 2023 — driven largely by the rerouting of Ukrainian grain — cargo traffic has normalized to approximately 58 million tonnes in 2024 and 52.2 million tonnes in 2025. Despite this recalibration, Constanța remains in Europe's top 10

seaports, handling roughly 1 million TEUs (Twenty-Foot Equivalent Units) annually and benefiting from aggressive infrastructure expansion.

Bulgaria: Intermodal upgrades and the green transition

Bulgaria operates a landlord port model anchored by two major commercial seaports, Burgas and Varna, which handled a combined 30.0 million tonnes in 2023. While throughput contracted slightly in 2024–2025 due to Black Sea trade disruptions, both ports are undergoing massive investment cycles to meet EU green transition standards.

- **Port of Burgas (TEN-T Core Network):** Currently executing the largest blue economy infrastructure program in the country. The EU-cofinanced REBIRTH28 project (completed in 2025) delivered Bulgaria's deepest berth, establishing an Advanced Container Terminal with a 350,000 TEU capacity. Combined with new internal railway tracks (FE2WC), Burgas is transforming into a low-emission multimodal hub.
- **Port of Varna (TEN-T Comprehensive):** Focusing on grain logistics and decarbonization. A €50 million InvestEU loan is financing a new deep-water grain terminal at Lake Beloslav (operational in 2026), while the EBRD and IFC are mapping out a €500 million upgrade strategy for Varna's main terminals.

Despite these investments, Bulgaria lacks a unified green port strategy. Crucial infrastructure like Onshore Power Supply (OPS) and electronic port community systems are currently absent, posing challenges for impending EU emissions regulations.

Türkiye: Diversified Scale and Hinterland Integration

Handling a staggering **531.7 million tonnes of cargo and 13.5 million TEU in 2024**, Türkiye is the undisputed heavyweight of regional maritime logistics. Its Black Sea port system — including Samsun, Trabzon, Rize, Filyos, and Zonguldak — links Anatolia, the Caucasus, and Central Asia to global markets.

Guided by the *2053 Transport and Logistics Master Plan*, Türkiye aims to evolve its ports from mere cargo-handling points into integrated blue economy platforms. This includes supporting offshore renewable services, marine education, and port-city regeneration.

- **Opportunities:** Establishing green ports, smart logistics, and strengthening the Middle Corridor routes.
- **Gaps:** Improving hinterland railway links, accelerating alternative fuel readiness, and enhancing digital logistics systems.

Georgia: regional transit and strategic connectivity

Georgia leverages its 315-kilometer coastline and key ports — Poti and Batumi — to function as a vital transit corridor for the South Caucasus. The sector is heavily integrated into international trade routes, bolstered by the *National Transport and Logistics Strategy 2023–2030*.

A defining feature of Georgia's maritime infrastructure is the upcoming Black Sea Submarine Cable Project, which bridges the energy and connectivity domains by linking Georgian electricity grids directly to Europe via the seabed.

The primary structural challenge in Georgia is institutional fragmentation. Port expansion and logistics are managed purely as transport policies, rarely intersecting with environmental sustainability or marine spatial planning. This lack of integrated governance leaves coastal

ecosystems vulnerable to infrastructure pressures and limits the development of a cohesive blue economy.

Table 8 – Cross country sector summary

Country	Key Ports	Cargo Throughput	Core Strategic Focus	Primary Gaps
Romania	Constanța	88M tonnes (2025 peak)*	TRACECA gateway, transshipment	Adapting to fluctuating regional trade volumes
Bulgaria	Burgas, Varna	30M tonnes (2023)	TEN-T Core upgrades, grain terminals	Missing Onshore Power Supply (OPS), digitalization
Türkiye	Samsun, Trabzon...	531.7M tonnes (2024)	2053 Logistics Hub, green ports	Hinterland rail links, alternative fuels
Georgia	Poti, Batumi	Regional Transit	Submarine Cable, transport corridor	Lack of integrated maritime spatial planning

Shipbuilding industry

The shipbuilding and ship repair industry in the Black Sea is undergoing a profound structural transformation. Across the basin, shipyards are transitioning away from traditional, low-cost bulk carrier construction toward high-value, specialized engineering—particularly green retrofitting, hybrid-electric vessel production, and offshore renewable energy support. However, this transition is uneven, with distinct clusters of high-tech manufacturing contrasting with areas of underutilized capacity.

Romania: The shift to offshore and green engineering

Romania's shipbuilding industry is fundamentally anchored by its geostrategic control over the maritime terminus of the Danube River and the deep-sea Port of Constanța. While the sector has seen a 36% contraction in employment over the past decade, it remains a robust, internationally competitive pillar of the Blue Economy, generating 23% of the nation's Blue Economy Gross Value Added (GVA) and employing 26% of its maritime workforce.

Rather than competing in the low-cost bulk carrier market, Romanian yards—located in Constanța, Mangalia, Tulcea, and Brăila—have successfully pivoted toward high-value, specialized construction.

Vard Tulcea Shipyard

The financial and operational leader of Romania's shipbuilding industry. Generating over 1.21 billion RON in revenue in 2022, the yard acts as the largest employer in Tulcea County (over 2,700 personnel). Operating in synergy with its Norwegian parent group, Vard Tulcea specializes in the hull construction of highly complex, eco-friendly tonnage designed to service the offshore renewable energy sector.

Constanța Shipyard S.A. (SNC)

One of the largest comprehensive repair and conversion facilities in Europe. As the only facility in the Black Sea basin capable of docking Suezmax and Capesize vessels (up to 200,000 DWT), SNC executes 80 to 100 complex repair and conversion projects annually.

The sector is actively navigating maritime decarbonization. A core priority is modernizing Romania's significant river shipping fleet (barges and pushers on the Danube) while investing in green port infrastructure, including shore-side electricity (cold ironing) and bunkering for LNG, methanol, and green hydrogen.

Bulgaria: A Knowledge-Intensive Repair Hub

Shipbuilding and ship repair is one of Bulgaria's most knowledge- and technology-intensive blue economy sectors, contributing approximately €131.0 million in GVA (13.3% of blue economy GVA) and employing around 4,500 FTE in 2022.

The sector is heavily concentrated in the **Varna–Beloslav area**, which hosts the country's largest maritime industrial ecosystem, alongside major facilities in Burgas (KRZ Port Burgas). Key actors include Bulyard Shipbuilding Industry, MTG Dolphin, Odessos Shiprepair Yard, and TEREM – KRZ Flotski Arsenal.

Since 2009, the Bulgarian sector has fundamentally restructured:

- New ship construction turnover declined by 70%.
- Ship repair and maintenance grew by 65%.
- Marine equipment manufacturing grew by 57%.

Despite labor productivity improving by 50% due to this specialization in repair services, Bulgaria currently lacks a national strategy for the green shipbuilding transition. There are notable skills gaps in alternative fuel systems and digital ship systems. However, the EU-wide demand for green retrofit services (e.g., scrubber installation, LNG conversion) presents a major growth opportunity for Varna's repair yards.

Türkiye: The Regional Powerhouse in Specialized Green Vessels

Türkiye possesses the most advanced, export-driven shipbuilding ecosystem in the Black Sea and Eastern Mediterranean. Emerging rapidly in the early 2000s through deliberate industrial clustering and state support, the sector is heavily concentrated in the **Tuzla** and **Yalova/Altınova** shipyard zones near Istanbul, housing nearly 100 shipyards and boatbuilding facilities.

Türkiye has carved out a highly lucrative niche: it largely avoids competing with Asian giants in massive container ship production, focusing instead on specialized, high-tech, and green-technology vessels.

Export dominance: Turkish ship and yacht exports reached a record \$1.94 billion in 2023. The country has overtaken China to become the world's leading manufacturer of tugboats and holds a dominant position in building specialized factory fishing vessels and live fish carriers, heavily exported to Northern Europe (particularly Norway).

Green shipping pioneers: Turkish yards are European leaders in maritime decarbonization technology. Recent outputs include the world's largest fully electric ferry, high-capacity LNG passenger ferries, and the world's first battery-powered fully electric harbor tugboat.

Capacity: Türkiye's maintenance and repair capacity has grown to roughly 26 million DWT, servicing 2,500 to 3,000 ships annually across 11 dry docks and 38 floating docks, capturing an estimated 13-15% of the global maritime maintenance market.

Despite its high-tech output, the Turkish sector faces headwinds from rising labor costs and difficulties accessing competitive foreign currency financing, which briefly stalled new contract signings and caused minor export contractions in 2024.

Georgia: Emerging Potential

Shipbuilding and ship repair activities are currently limited in Georgia compared to the larger maritime economies in the basin. Existing operations are primarily small-scale and service-oriented (basic maintenance and minor repairs for transit vessels) rather than industrially integrated or export-oriented. Consequently, the sector plays a minor role in Georgia's current maritime economy and has limited strategic visibility.

Table 8 – Regional comparison

Metric / Attribute	Romania	Bulgaria	Türkiye	Georgia
Primary Hubs	Constanța, Tulcea, Mangalia	Varna, Burgas	Tuzla, Yalova, Ereğli	Batumi, Poti (Small scale)
Core Specialization	Offshore wind vessels, large-scale conversions, river fleets	Ship repair, retrofitting, marine equipment	High-tech green vessels, electric ferries, tugs	Basic service and minor repair
Key Strength	Unique deep-sea to inland waterway (Danube) connectivity	Highly concentrated maritime education and repair cluster	Global leadership in specialized and electric vessel exports	Strategic transit location
Primary Challenge	Financing fleet decarbonization and workforce decline	There is no national green retrofit strategy; skills gaps	Rising labor costs and financing constraints	Lack of industrial integration

Costal and maritime tourism

Coastal and maritime tourism stands as the single largest economic engine and employment pillar within the collective Black Sea blue economy. While the sector has demonstrated remarkable post-pandemic resilience across all four partner nations, it remains highly vulnerable to extreme structural seasonality, localized environmental pressures, and infrastructure imbalances.

The region is currently transitioning away from traditional, volume-driven "sun-and-sea" mass tourism toward highly diversified, climate-resilient, and value-added models. This includes leveraging balneological (spa) wellness, eco-tourism, nautical sports, and rich marine cultural heritage.

Romania: Strategic recalibration and year-round wellness

The Romanian Black Sea coast stretches from Musura Bay to Vama Veche, generating significant seasonal revenue and supporting 20% of the national Blue Economy workforce. Following a robust post-pandemic recovery—where tourism's national GDP contribution rose from 2.98% in 2019 to 4.19% in 2023—capital injection has accelerated. In 2024, hotel investments surged by 56% to €69.3 million, driving early-season bookings up by 32%.

However, in 2025 and 2026, the sector is undergoing a major strategic recalibration to fight severe seasonality, as 75% of all visits are compressed between mid-June and late August along a 120 km urbanized beachfront. Operators are transitioning toward climate-resilient, year-round models by utilizing highly localized regional profiles:

- Sulina: A water-accessible gateway to the Danube Delta focused on low-density eco-tourism.
- Mamaia: The high-end nightlife and festival capital featuring extensively widened beaches.
- Eforie (Nord and Sud): Health and wellness anchors utilizing therapeutic mineral waters and sapropelic healing mud from Lake Techirghiol to maintain year-round operability.
- The Mythological Resorts (Olimp, Neptun, Venus, etc.): Historically state-built zones undergoing a luxury resurgence via massive private investments.
- Costinești and Vama Veche: Youth-centric and bohemian alternative destinations centered on beachfront camping and music culture.

To protect pristine biodiverse shores (like Corbu and Vadu) under the Danube Delta Biosphere Reserve from peak-season wastewater and erosion stresses, Romania is deploying the *National Strategy for Tourism Development 2025–2035* (adopted September 2024) to expand medical tourism and MICE (Meetings, Incentives, Conferences, Exhibitions) capabilities, alongside the annual "Litoralul pentru toți" shoulder-season social pricing program.

Bulgaria: The macroeconomic heavyweight

Tourism is Bulgaria's dominant Blue Economy sector by every metric, generating 50.9% of its total Blue Economy GVA (€500.8 million) and commanding 60.6% of its workforce (32,100 FTE) as of 2022. Governed by the Ministry of Tourism under the *National Tourism Strategy 2014–2030*, foreign holiday arrivals grew from 5.8 million in 2024 to 6.0 million in 2025, with the Black Sea coast absorbing roughly half of all entries.

Despite its massive scale, Bulgaria's model is structurally fragile, relying heavily on low-margin price competition and short summer windows across its major resort clusters (Nessebar, Varna, Balchik, Sozopol, Primorsko, and Burgas).

- Nautical and Cruise Gaps: Nautical tourism remains severely underdeveloped, accounting for only 1,000 registered yachts, 14 licensed marinas, and 800 employees. Cruise tourism is similarly marginalized (0.23% of tourism GVA) due to the structural inability of Bulgarian seaports to accommodate large cruise vessels without deep-water infrastructure investments.
- Deficiencies: Growth is constrained by the absence of an updated National Tourism Action Plan, the absence of a comprehensive integrated coastal management framework, and limited monitoring of environmental carrying capacity and tourism-related ecological impacts.

Georgia: High-growth urbanization and institutional transitions

Coastal and maritime tourism represents the most visible, commercially developed component of Georgia's maritime economy, focused heavily around the Adjara region and the rapidly modernizing coastal skyline of Batumi. Over the past decade, growth has been driven by aggressive growth-oriented frameworks and massive real estate and hospitality investments.

The institutional setting relies on the Georgian National Tourism Administration (GNTA) and the Adjara Department of Tourism and Resorts, with heavy municipal infrastructure and coastal rehabilitation funded by the Ministry of Regional Development and Infrastructure (MRDI).

- Strategic shift to sustainability: Historically, Georgia focused purely on quantitative indicators (visitor volume and infrastructure footprints). However, the ongoing development of the *National Tourism Strategy 2035* and the recent adoption of the *Law of Georgia on Tourism* mark a crucial policy transition. The law introduces Destination

Management Organizations (DMOs) to foster collaborative, public-private destination governance.

- Structural bottlenecks: Georgia faces critical fragmentation. Tourism development is treated strictly as commercial real estate policy, completely disconnected from Marine Spatial Planning (MSP) or environmental coastal management. This creates immense pressure on urban waste networks and sensitive marine ecosystems during peak seasons.

Türkiye: Non-mass diversification and the sailing infrastructure gap

Türkiye boasts an immense national tourism economy, reaching 62.3 million visitors and \$61.1 billion in revenue in 2024. While its Mediterranean and Aegean coastlines cater to mass beach tourism, Türkiye's Black Sea coast (specifically the Eastern Black Sea TR90 region) utilizes an entirely different, low-density profile. It centers on nature, adventure, cultural highlands, marine heritage, and seafood gastronomy across hubs like Trabzon, Rize, Artvin, Giresun, and Ordu. The primary frontier for blue economy expansion in Türkiye is water and sailing sports, which faces severe structural and legal barriers:

- The Mooring deficit: The entire Black Sea basin possesses a minor total mooring capacity of just 2,869 berths across 26 marinas (compared to 606,711 berths across the wider Mediterranean basin). Türkiye's Black Sea coast currently has zero dedicated marina mooring capacity, whereas its Marmara and Mediterranean coasts command 22,000.
- Legal and spatial hurdles: Building boat piers and marinas is exceptionally difficult due to strict environmental and development conditions mandated by Türkiye's national Coastal Law. Furthermore, existing coastal shelters are largely occupied by mostly idle fisherman cooperatives.
- Proposed solutions: Fulfilling this sector's potential requires public intervention to establish a hybrid "fisherman/sailing club" utilization model in coastal shelters, opening the door for Public-Private Partnerships (PPPs) and cross-border funding mechanisms like Interreg NEXT Black Sea Basin.

Table 9: Comparative analysis

Feature / Metric	Romania	Bulgaria	Georgia	Türkiye (Black Sea Coast)
Economic Scaling	€1.5B total Blue Economy GVA; tourism is 20% of BE workforce.	€500.8M (50.9% of 32,100 (60.6% of employment)).	GVA of BE); FTE of BE	Most visible and commercially developed BE sector; centered in Adjara/Batumi.
Dominant Tourism Profile	Diversified: Spa/wellness clusters, nightlife (Mamaia), delta eco-tourism, cultural heritage.	Traditional "Sun-and-Sea" mass resort clusters; nascent eco-circuits.	High-intensity urban hospitality, coastal real estate, MICE, and recreation.	Nature, adventure, mountain-coastal interface, gastronomy, and cultural heritage.

Core Strategic Framework	National Strategy for Tourism Development 2025–2035.	National Tourism Strategy 2014–2030 The implementation plan has to be updated	Transitioning to National Tourism Strategy 2035 & new Law on Tourism.	2053 Master Plan principles; strict adherence to national Coastal Law.
Primary Infrastructure Gaps	Wastewater infrastructure during peak volumes; coastal erosion mitigation.	Underdeveloped nautical/yachting spaces; inadequate cruise ship berths.	Lack of integrated Marine Spatial Planning (MSP) and solid waste systems.	Zero active marina mooring capacity; restrictive coastal spatial regulations.
Critical Sector Challenge	Compressed 4-month summer season window (mid-June to August).	Extreme seasonal vulnerability and low-margin price competition.	Fragmented governance; growth-oriented models outstripping carrying capacity.	Conflict between idle fishing cooperatives and modern sailing club demands.

Marine Living Resources — Fisheries and Aquaculture

The fisheries and aquaculture sector across the Black Sea region—encompassing Romania, Bulgaria, Türkiye, and Georgia—represents a vital pillar of the blue economy. While the sector provides critical employment, food security, and regional heritage, it is currently characterized by stark structural asymmetries. Türkiye acts as the regional powerhouse in both wild capture and aquaculture, while Romania and Bulgaria navigate the constraints of aging small-scale fleets and European quota limits. Meanwhile, Georgia's sector remains largely nascent, requiring significant investment to integrate into broader maritime strategies.

Despite these differences, all four nations face shared imperatives: transitioning toward sustainable ecosystem-based management, modernizing value chains, and closing the gap in high-value seafood processing.

Table 10: The current production volumes and structural characteristics of the sector across the four nations based on recent data (2023–2024)

Country	Wild capture	Aquaculture	Key commercial species	Fleet and sector profile
Türkiye	356,070 t	577,124 t	Anchovy, Turkish Salmon, Trout	Highly active; massive export growth; concentrated in Eastern Black Sea.
Bulgaria	6,704 t	14,388 t	Sprat, Rapa whelk, Trout, Carp, Mussels	95% of fleet <12m (avg. age 23 yrs); heavily import-reliant processing.
Romania	6,357 t (Total)*	10,050 t	Rapa whelk, Cyprinids, Trout	85% of fleet <12m; inland capture (3,830 t) exceeds marine capture (2,527 t).
Georgia	Limited	Limited	Inland freshwater species	Small-to-medium scale; low tech adoption; underdeveloped value chains.

* Romanian wild capture includes 2,527 t marine and 3,830 t inland.

Wild-capture fisheries: ecological shifts and fleet constraints

Commercial marine extraction in the Black Sea is heavily shaped by geopolitical tensions, systemic ecological shifts, and stringent regulatory frameworks.

In Romania and Bulgaria, the wild-capture fleets are overwhelmingly artisanal. Approximately 85% of Romania's vessels and 95% of Bulgaria's 1,205 active vessels measure under 12 meters in length. These aging fleets are strictly limited by the EU's Common Fisheries Policy (CFP), which enforces firm Total Allowable Catches (TACs) on vulnerable historical stocks like turbot and European sprat. Consequently, both nations have experienced a massive ecological and economic shift toward the invasive veined rapa whelk (*Rapana venosa*). In Romania, the rapa whelk now accounts for 70% to 85% of total marine landings and is the undisputed economic driver of the capture sector, exported primarily to Asian markets (Tiganov, 2018). Bulgaria mirrors this trend, with sprat and rapana jointly accounting for over 83% of their 2023 catch (NSI/IARA).

Conversely, Türkiye's capture fisheries operate on a vastly different scale, landing over 356,000 tonnes in 2024. The Eastern Black Sea region drives this output, with heavy reliance on anchovy and pelagic species (Country Report Türkiye). However, the Turkish fleet faces intense sustainability pressures, including overfishing, illegal and unreported fishing, and climate change impacts.

Georgia's marine fisheries remain underdeveloped. Concentrated along the immediate coast, the sector is hindered by a lack of modernization, weak investment, and fragmented governance, operating largely outside a cohesive maritime spatial planning framework.

Aquaculture: the regional growth engine

Aquaculture is universally recognized as the future growth engine for the region's marine living resources, though development stages vary drastically.

- Türkiye is the undisputed leader, with aquaculture production (577,124 tonnes) now surpassing its wild capture. Trabzon has emerged as a major hub, seeing aquaculture production double between 2018 and 2022. The industry is heavily export-oriented, driven by Turkish salmon and trout, and supported by a robust network of hatcheries and feed suppliers [23].
- Bulgaria and Romania are actively pivoting toward aquaculture to offset declining wild catches. Bulgaria produced 14,388 tonnes in 2023 (primarily freshwater trout and carp, alongside 2,552 tonnes of Black Sea mussels) and targets 20,000 tonnes by 2030. Romania produced 10,059 tonnes of exclusively freshwater species (cyprinids and trout) in 2024, with a 2030 target of 17,000 tonnes. Both nations leverage European funds (EMFAF) to subsidize the transition to Recirculating Aquaculture Systems (RAS) and climate-resilient models.
- Georgia recently approved a national aquaculture strategy [63], but production remains limited to inland freshwater systems. To scale, the country urgently requires investments in aquatic animal health, technology adoption, and research.

Processing, trade, and value-chain deficits

A shared vulnerability across the Black Sea region is the structural weakness of the seafood processing and value-addition supply chain.

Despite their coastal access, both Romania and Bulgaria face massive raw material deficits and are net importers of seafood. In Romania, the 41 registered fish processors rely on imports for

roughly 80% of their raw materials (e.g., frozen mackerel and herring) just to maintain year-round operations. Bulgaria similarly covers only 45% of its domestic demand with local supply, driving a record \$196.7 million in imports in 2025 (USDA FAS, 2026).

While Türkiye has abundant raw material, it struggles with a "value-added gap." Processed outputs remain concentrated in low-margin products like fish flour, fish oil, and basic fillets. Efforts to establish specialized industrial zones for fisheries in regions like Trabzon have been blocked by difficult topography and site availability. Georgia entirely lacks the processing capacity and international value-chain integration necessary to make its sector competitive.

Governance and strategic outlook

Unlocking the full potential of the Black Sea's marine living resources requires overcoming distinct bureaucratic and structural hurdles:

1. **Administrative bottlenecks:** In Bulgaria, complex water-use licensing under the Law on Waters acts as a primary barrier to aquaculture expansion. Similarly, Türkiye reports that inter-sectoral conflicts and bureaucratic processes hinder marine aquaculture zoning.
2. **Fund absorption:** Bulgaria's PMFA 2021–2027 shows payment executions of only 13.1% as of mid-2026, highlighting a persistent inability among SMEs and Fisheries Local Action Groups (FLAGs) to navigate project preparation.
3. **Regional integration:** For Georgia, the immediate priority is integrating fisheries and aquaculture governance—currently siloed under the Ministry of Environmental Protection and Agriculture (MEPA)—into broader Blue Economy and Coastal Management strategies.

Moving forward, alignment with the Common Maritime Agenda (CMA) and the General Fisheries Commission for the Mediterranean (GFCM) will be critical. Future regional investments must prioritize ecosystem-based fisheries management, digital traceability, the expansion of cold-chain logistics for offshore aquaculture, and the development of blue skills to ensure sustainable, high-value economic growth across the Black Sea basin.

Maritime Cultural Heritage

The Maritime Cultural Heritage sector represents a specialized and rapidly evolving pillar of the Black Sea's blue economy, bridging the preservation of ancient history with modern tourism and academic research. Across the basin, nations are increasingly valorizing these historical sites to diversify coastal appeal, attract year-round cultural tourism, and reduce the economic vulnerability associated with the short summer beach season.

Romania: bridging ancient history and modern tourism

By valorizing its terrestrial and underwater archaeological assets, Romania is actively building economic resilience along its coastline. The sector is supported by international cross-border partnerships, such as the "Blue Gates" project. Uniting institutions from Romania, Bulgaria, Ukraine, and Türkiye—and coordinated by entities like the Constanța-based Black Sea Universities Network (BSUN)—this initiative explicitly positions underwater cultural heritage as a vital economic asset alongside maritime transport and fishing.

A defining recent achievement for the regional blue economy is the historic restoration of the Constanța Casino, the architectural crown jewel of the Romanian Riviera. Inaugurated in 1910 in a striking Art Nouveau style, the building had suffered decades of severe degradation.

Recognizing its vital importance to local identity and the tourism economy, a massive capital restoration project was initiated in April 2020. The complex five-year rehabilitation process required an investment exceeding RON 200 million (approximately €40 million). The

meticulously restored Casino officially reopened on May 21, 2025, successfully reclaiming its status as a major cultural anchor.

Because the Black Sea experienced rapid sea-level rise during the early Holocene (~8,000 years ago), numerous prehistoric landscapes remain preserved beneath the coastal waters and deltaic sediment. Key assets include:

- **Taraschina:** a submerged artificial mound located in the central wetlands of the Danube Delta. Excavated by a joint French-Romanian multidisciplinary mission, it provides crucial insights into Chalcolithic communities from over 6,000 years ago.
- **Scythia Minor:** ancient Greco-Roman port cities—including Tomis, Callatis, and Histria—continue to drive terrestrial heritage tourism along the immediate shoreline.

Bulgaria: UNESCO recognition and regional leadership

Bulgaria's Black Sea coast holds a dense concentration of maritime cultural heritage, ranging from submerged prehistoric continental shelf settlements to ancient harbour complexes and historic fortified port towns. Protection of these assets is heavily integrated into national planning, with specific spatial protection zones designated in the Maritime Spatial Plan 2021–2035.

The most prominent terrestrial site is Nessebar, a UNESCO World Heritage Site whose ancient port remains and submerged archaeological deposits form one of the best-documented maritime complexes on the Black Sea.

A major institutional milestone was achieved on November 10, 2025, when the Centre for Underwater Archaeology in Sozopol was designated by UNESCO as a Category 2 Centre, now operating as the Institute for Underwater Heritage. This internationally recognized body holds a regional mandate for the Black Sea basin and the Lower Danube, focusing on:

- Research, conservation, and promotion of underwater cultural heritage.
- Scientific exchange and capacity-building.
- Strengthening national inventories to combat illegal trafficking.

UNESCO's feasibility study acknowledged that the absence of specialized state bodies for underwater heritage across several riparian states represents a systemic regional gap—positioning Bulgaria's new Institute as a critical asset for developing regional heritage diving tourism and maritime museum circuits.

Türkiye and Georgia: emerging heritage potentials

While currently less integrated into structured maritime spatial planning than in Romania or Bulgaria, the cultural heritage assets of Türkiye and Georgia offer substantial long-term value for the regional blue economy.

Türkiye possesses a vast array of maritime cultural heritage, from ancient Byzantine shipwrecks to Ottoman coastal fortresses. While its underwater archaeology sector is highly developed and globally recognized in the Aegean and Mediterranean seas, the Black Sea coast offers immense, largely untapped potential for mapping submerged historical assets and establishing specialized niche diving tourism.

Steeped in the ancient mythology of Colchis, Georgia's Black Sea coast holds significant archaeological promise. Currently, maritime cultural heritage remains a largely underexplored niche within the national blue economy framework. However, it presents a strategic opportunity for future international research partnerships, coastal tourism diversification, and closer alignment with the sustainability and cultural goals of the Common Maritime Agenda (CMA).

Marine renewable energy

Marine renewable energy, with a particular focus on offshore wind, represents the most significant emerging frontier within the Black Sea's blue economy. Driven by European decarbonization mandates and the region's highly favourable meteorological conditions, offshore renewables are transitioning from theoretical concepts to strategic imperatives.

However, the sector's maturity across the basin is sharply uneven. While Romania is rapidly establishing a bankable market through legislative leaps, Bulgaria is stalled by regulatory bottlenecks despite strong engineering capabilities. Meanwhile, Türkiye and Georgia remain at the very beginning of their offshore energy journeys.

Table 11: Regional sector overview

Country	Maturity level	Offshore wind potential and focus	Key barrier to commercialization
Romania	Emerging (Bankable)	76 GW theoretical potential; fixed & floating.	Managing spatial competition (fisheries/transport).
Bulgaria	Pre-commercial (Tier 2)	R&D hub for floating offshore wind testing.	Incomplete regulatory and spatial planning framework for offshore renewable energy
Türkiye	Nascent	Very early exploration stages.	Lack of dedicated offshore infrastructure and zoning.
Georgia	Undeveloped	No strategic focus on offshore renewables.	National energy policy prioritizes terrestrial hydropower.

Romania: the regulatory pioneer

Historically, Romania's wind energy success was confined to onshore corridors like Dobrogea. However, the northwestern sector of the Romanian Exclusive Economic Zone (EEZ) offers exceptional wind resources, holding a theoretical capacity of at least 76 Gigawatts (GW). Because much of this yield is in deep waters, future deployment will rely on a mix of traditional fixed-bottom structures and floating offshore wind turbines (Elston, 2024).

The major turning point for Romania was the recent enactment of Law no. 121/2024. This critical legislation dismantled historical barriers by establishing clear procedures, institutional roles, and developer rights. By providing legal certainty, Romania has officially transitioned its EEZ into a highly attractive market for foreign and domestic renewable energy investments.

As development accelerates, spatial competition with traditional fisheries and maritime transport is intensifying. To mitigate this, Romanian academic and policy frameworks are exploring multi-use platforms—innovative models that physically integrate offshore wind infrastructure with other marine activities, such as aquaculture operations (Manolache, 2024). This synergistic approach aims to maximize spatial efficiency while protecting coastal community resilience and marine ecology.

Bulgaria: an engineering hub awaiting legislation

In Bulgaria, offshore wind and wave energy are prioritized under the Common Maritime Agenda (CMA) and the National Energy and Climate Plan (NECP) 2021–2030. While the country currently has no operational installations, it possesses a massive strategic advantage: established maritime engineering and testing capabilities.

Institutions like the Bulgarian Ship Hydrodynamics Centre (BSHC) and the Technical University of Varna are actively participating in European research, testing, and pilot activities for floating offshore wind technologies. This positions Bulgaria to participate in international supply chains as an innovation and simulation provider even before it launches its own commercial-scale deployments.

However, the development of offshore wind in Bulgaria remains constrained by an incomplete regulatory and spatial planning framework. The updated National Energy and Climate Plan notes that legislative changes are still being prepared to establish the conditions for assessing offshore wind potential, determining the suitability of selected marine areas for investment projects, and constructing energy installations in maritime spaces. Although a broader planning process for priority wind energy areas is envisaged, offshore-specific development areas have not yet been formally designated, resulting in continued regulatory and investment uncertainty.

Türkiye and Georgia: nascent horizons

- **Türkiye:** Despite having a highly developed terrestrial renewable energy sector and a massive maritime footprint, Türkiye is at the very beginning of its marine renewable energy journey in the Black Sea. The country is currently in the early exploratory phases of assessing its offshore wind potential, but commercial-scale development will require significant future investments in dedicated supply chains, port infrastructure, and regulatory zoning.
- **Georgia:** Marine renewable energy remains undeveloped. National energy policy and investment are heavily concentrated on terrestrial renewable sources, particularly hydropower. Offshore energy has not yet emerged as a strategic priority, leaving the country with virtually no institutional frameworks, technical expertise, or investment incentives related to marine renewables.

Marine biotechnology

Marine (or "Blue") biotechnology represents a highly specialized and rapidly emerging pillar of the Black Sea's blue economy. Unlike traditional sectors that rely on high-volume extraction or logistics, marine biotechnology focuses on the advanced exploration of aquatic organisms—such as microalgae, macroalgae, bacteria, and invertebrates. The goal is to convert marine biomass and processing by-products into high-value applications, including natural cosmetics, pharmaceuticals, nutraceuticals, and next-generation biofuels, while simultaneously providing environmental remediation.

Across the region, the sector is currently navigating a critical transition: attempting to bridge the gap between academic research and viable, commercial-scale industries.

Table 12: Regional sector overview

Country	Maturity level	Primary focus areas			Key barrier	
Bulgaria	Emerging (Tier 2)	Bioactive algae	compounds from (5 species);		Underdeveloped scale infrastructure	lab-to-pilot and

		therapeutic bioremediation.	brine/mud;	national commercialization pathways.
Romania	Emerging (Tier 2)	Micro/macroealgae cultivation; advanced cosmeceuticals; coastal restoration.		"Valley of death" between lab breakthroughs and market entry; high CAPEX.
Türkiye	Nascent	Algae cultivation; alternative feeds; circular economy SME development.		Requires stronger linkages between research institutions and industry.
Georgia	Undeveloped	Limited university research; environmental monitoring.		Weak integration with private investment and innovation ecosystems.

Romania and Bulgaria are actively driving the region's blue biotech research, leveraging their institutional capacities to align local biological potential with European bioeconomy mandates.

In Romania, the sector is anchored by the National Institute for Marine Research and Development "Grigore Antipa" (INCDM). Applications here serve a dual purpose: driving economic competitiveness and executing ecological restoration. On the commercial front, researchers are isolating specific marine enzymes to modernize the historical health sector (moving beyond traditional sapropelic mud from Lake Techirghiol to advanced cosmeceuticals). Environmentally, cultivated macroalgae beds act as "nature-based solutions"—bio-filters that recycle agricultural runoff from the Danube and combat eutrophication. A flagship initiative is the EX-AQUA project (running through 2027), which focuses on scalable cultivation technologies for microalgae and macroalgae (like *Ulva* and *Cystoseira barbata*) as strategic raw materials.

In Bulgaria, research is heavily concentrated at the Institute of Oceanology-BAS (IO-BAS) and Varna Medical University (VMU). VMU is currently conducting large-scale research on five Black Sea algae species (red, green, and brown) for pharmaceutical and cosmetic use. Beyond algae, Bulgaria is focusing on the circular biorefinery approach—valorizing by-products like rapana shells and mussel processing waste—and standardizing its coastal therapeutic brine resources (Pomorie, Tuzlata) for EU health claims. EU projects like SEAREFINERY and WASTE2TASTE are active in the country to help develop these value chains.

Despite vast theoretical potential, neither Romania nor Bulgaria is currently represented in EU blue biotechnology enterprise statistics. The sector is highly capital-intensive, requiring specialized laboratory infrastructure, prolonged testing phases, and a highly trained STEM workforce.

This creates a pronounced "valley of death" between laboratory breakthroughs and commercial market entry, exacerbated by limited domestic technology transfer mechanisms, weak IP protection frameworks (Nagoya Protocol compliance), and limited access to early-stage venture capital.

To overcome these structural barriers, the region is looking toward newly established EU frameworks:

EU Bioeconomy Strategy (2025): Specifically, Pillar II ("From Lab to Fab") directly addresses the research-to-market gap, prioritizing biotechnology as a critical technology under the Strategic Technologies for Europe Platform (STEP).

EU Biotech Act (2025): Proposes fast-track permitting and priority financing for strategic biotech projects, aimed directly at reducing the regulatory friction that impedes SME development.

Targeted funding: Sector growth relies heavily on Horizon Europe Cluster 6, the Circular Bioeconomy Europe Joint Undertaking (CBE JU), and EMFAF Priority 2 innovation calls.

While operating at an earlier stage than their western neighbours, both Türkiye and Georgia possess foundational assets for future development.

Türkiye views marine biotechnology as a vital bridge between research institutions and industries spanning food, feed, cosmetics, and environmental remediation. The opportunity here extends beyond high-tech laboratories into applied pilots—such as wastewater-linked biomass production, alternative feed inputs for its massive aquaculture sector, and SME product development.

In Georgia, marine biotechnology remains at a very early stage. While some environmental monitoring and basic research exist within universities and public agencies, these efforts are not yet linked to broader commercialization frameworks or private investment, requiring significant capacity-building to integrate into the regional innovation ecosystem.

Ocean monitoring and marine data

Ocean monitoring and marine data collection form the critical scientific baseline that underpins all other blue economy sectors in the Black Sea. While it is rarely captured as a standalone economic sector in national statistics, accurate environmental observation is a prerequisite for de-risking offshore wind investments, executing maritime spatial planning, maintaining sustainable fisheries, and combating the basin's severe environmental pressures.

Across the region, the primary challenge is no longer just collecting data, but overcoming institutional fragmentation to integrate it into cohesive, basin-wide ecosystems like the European Marine Observation and Data Network (EMODnet) and the EU Digital Twin of the Ocean (DTO).

Table 13: Regional sector overview

Country	Maturity level	Institutional focus and infrastructure	Primary gaps
Romania	Emerging (Tier 2)	NIMRD & GeoEcoMar; robust forecasting models; integrated into EMODnet & Copernicus.	Needs broader basin-wide data harmonization to support emerging sectors fully.
Bulgaria	Emerging (Tier 2)	IO-BAS; Euro-Argo ERIC full member; operates key submarine cables (KAFOS, Caucasus).	Fragmented data across agencies; MSFD compliance gaps; lacks an open-access national data center.
Türkiye	Emerging (Tier 2)	Led by robust academic institutes (e.g., METU IMS); strong participation in basin-wide projects.	Requires stronger alignment between national monitoring frameworks and transnational open-data ecosystems.
Georgia	Early Stage	Led by National Environment Agency and international projects.	Weak digital infrastructure; fragmented monitoring; limited observation capacity.

Both Romania and Bulgaria possess comparatively strong scientific infrastructures relative to their size, largely driven by national research institutes. However, they navigate distinctly different phases of data integration.

In Romania, the sector is driven by the National Institute for Marine Research and Development "Grigore Antipa" (NIMRD) and GeoEcoMar. These hubs manage complex coastal observation networks and real-time early warning systems. Crucially, Romania excels at translating raw data into applied forecasting models. By tracking physicochemical variables—such as total nitrogen, water temperature, and dissolved oxygen—scientists can directly manage biodiversity loss and track climate change impacts on commercial fish stocks (Petrea et al., 2021).

Romanian infrastructure is heavily integrated into broader European frameworks (EMODnet, Copernicus Marine Service) and actively drives multi-national initiatives like the EU-funded DOORS and BRIDGE-BS projects, which aim to foster participatory marine data ecosystems across the basin.

Bulgaria's ocean monitoring is anchored by the Institute of Oceanology (IO-BAS Varna). The country holds a distinct comparative advantage as the only full Black Sea member of the Euro-Argo ERIC (the autonomous underwater profiling program) and is a critical node for digital connectivity, operating two major submarine fibre optic cables (KAFOS and the Caucasus Cable System).

Despite these assets, Bulgaria faces urgent environmental pressures—the World Bank (2020) identified 10 highly polluted beaches and 77 industrial sites emitting wastewater into the basin. A major structural gap is data fragmentation: monitoring data is siloed across different ministries and municipal systems, preventing the creation of an open-access national marine data centre. Consequently, the national monitoring program currently covers only 5 of the 11 descriptors required under the Marine Strategy Framework Directive (MSFD), triggering a compliance procedure before the Court of Justice of the EU.

Türkiye conducts comprehensive marine environmental monitoring through its robust network of academic and research institutions. While possessing significant vessel and scientific capacity—and acting as a key partner in basin-wide integrations like BRIDGE-BS and DOORS—the country faces the ongoing challenge of harmonizing its extensive national datasets with transnational, open-access European frameworks to fully support ecosystem-based management and spatial planning in the highly stressed Black Sea.

Ocean monitoring in Georgia remains at a very early stage. Activities are primarily conducted by the National Environment Agency and rely heavily on support from international partners. The country currently lacks the integrated maritime data systems and advanced marine observation infrastructure seen on the western coast of the Black Sea. Data collection is often fragmented across localized projects, reducing its utility for evidence-based blue economy governance. Moving forward, a strategic transition toward maritime digitalization, green port technologies, and digital logistics solutions will be required to build Georgia's baseline observational capacity.

Marine infrastructure

Maritime infrastructure—encompassing submarine communications cables, offshore energy pipelines, and coastal defense engineering—forms the physical backbone of the Black Sea's blue economy. As climate change accelerates coastal erosion and geopolitical shifts redefine European energy and digital corridors, these assets are transitioning from basic utilities to critical pillars of geoeconomic resilience.

Across the region, development is heavily bifurcated: Romania and Türkiye are executing massive, multi-billion-euro deep-water energy and coastal protection projects, while Bulgaria and Georgia face urgent needs to upgrade their coastal defenses and integrate their strategic submarine networks into cohesive management plans.

Table 14: Regional sector overview

Country	Sector maturity	Strategic focus	Primary gaps and vulnerabilities
Romania	Advanced / Expanding	Deep-water gas pipelines (Neptun Deep); massive ICZM beach nourishment; BSSC cable.	High capital requirements for sustaining massive coastal protection works.
Bulgaria	Emerging (Tier 2)	Digital connectivity (3 submarine cables); Trans-Balkan pipeline.	48% of beaches eroding; there is no dedicated plan for Integrated Coastal Zone Management (ICZM).
Türkiye	Advanced	Ultra-deep-water gas extraction (Sakarya field); major pipeline hubs (TurkStream); expansive coastal engineering.	Balancing massive infrastructure expansion with marine spatial planning.
Georgia	Emerging	Landing node for the Black Sea Submarine Cable (BSSC); port expansions.	Severe coastal erosion in Batumi; requires massive investment in coastal stabilization.

The Black Sea is rapidly becoming one of Europe's most vital nodes for energy extraction and digital telecommunications.

Romania is currently executing a massive expansion of its offshore infrastructure, driven by the exploitation of significant natural gas reserves. Spearheaded by the €4.7 billion Neptun Deep project and the operational Midia Gas Development, this involves the installation of highly complex deep-water production systems, including over 160 kilometres of subsea flowlines and trunk pipelines connecting offshore platforms to onshore processing facilities at Tuzla and Vadu. Concurrently, Romania is positioning itself as a digital and renewable energy hub through the planned Black Sea Submarine Cable (BSSC) project. This ambitious 1,155-kilometer high-voltage direct current (HVDC) interconnector, coupled with parallel fibres-optic networks, will link the Romanian grid directly to the South Caucasus (landing in Georgia).

Bulgaria is a critical transit zone for regional connectivity. Three major submarine fiber optic cable systems (including KAFOS and the Caucasus Cable System) traverse its waters, alongside the Trans-Balkan Pipeline. However, Bulgaria currently lacks a formalized coordination mechanism between cable operators and Maritime Spatial Planning (MSP) authorities, leaving these strategic assets vulnerable to spatial conflicts.

Türkiye operates on a massive scale, serving as the landing point for the TurkStream pipeline. More recently, the nation has invested heavily in its own ultra-deep-water infrastructure to extract gas from the Sakarya field, connecting offshore wells to the massive Filyos natural gas processing facility on the Black Sea coast.

Parallel to deep-water developments, robust coastal engineering is an urgent priority across the basin to mitigate severe coastal erosion and adapt to climate-induced sea-level rise.

In response to changing wave regimes and anthropogenic pressures threatening its lucrative tourism economy, Romania is executing some of the largest coastal rehabilitation operations in the basin. Financed by EU structural funds, these Integrated Coastal Zone Management (ICZM) interventions—spanning Constanța, Mamaia, and Eforie—combine "soft" engineering (millions of cubic meters of dredged offshore sand for beach nourishment) with "hard" stabilization structures like submerged breakwaters and groynes to halt shoreline retreat (Jugănaru & Jugănaru, 2021).

Bulgaria faces a more fragmented approach to coastal defence. Based on orthophoto mapping, approximately 16.2% of the Bulgarian coast features engineered structures. Despite these interventions, 48% of Bulgaria's sand beaches remain affected by erosion.

Cliff erosion is accelerating rapidly (up to 0.30 meters/year in the northern loess formations). With sea levels rising 1.5–3 mm/year, highly populated tourist and heritage centres like Nessebar and Burgas are at significant risk of coastal flooding. The critical gap preventing effective adaptation is the absence of an integrated coastal zone management (ICZM) plan, which is required under the EU ICZM Protocol but has yet to be implemented.

On the eastern coast, Georgia faces similar existential threats to its maritime real estate, particularly in Batumi, where severe coastal erosion constantly threatens urban infrastructure and tourism assets. While the country is expanding its maritime footprint through new port developments (like Anaklia), managing the dynamic coastal geomorphology requires significantly more investment in hard and soft engineering solutions aligned with modern ICZM principles.

Other sectors

The most significant shift in regional policy is the elevation of marine ecosystem protection from a passive environmental mandate to an active, economically valuable sector—particularly through the lens of **blue carbon** (the carbon captured by the world's coastal and ocean ecosystems).

Romania is actively transitioning to a regenerative blue economy. A prominent example is the ongoing initiative to replant "underwater forests" of native brown algae (*Cystoseira barbata*) along the Constanța coastline, implemented by local NGOs like Mare Nostrum. Beyond restoring crucial nursery grounds, these macroalgae habitats and regional seagrass meadows are being actively monitored for their carbon sequestration potential. Supported by pan-European projects like BRIDGE-BS, Romania aims to establish blue carbon not just as a scientific metric, but as a highly valuable climate-financing asset.

Bulgaria holds some of the most significant blue carbon assets in the basin, primarily within its internationally recognized coastal wetlands (e.g., Atanasovsko and Pomorie Lakes in the Burgas region). While these Ramsar-designated sites and Black Sea *Zostera marina* (posidonia) meadows are recognized as powerful carbon sinks, Bulgaria currently lacks a national blue carbon accounting or certification framework. Development priorities include quantifying this sequestration capacity to pilot nature-based biodiversity offsetting schemes.

In Georgia, blue carbon initiatives and marine ecosystem restoration remain largely underdeveloped. While biodiversity conservation activities exist, they are typically executed through broader, terrestrial-focused environmental programs rather than through dedicated, innovation-driven blue economy mechanisms.

Digital technologies represent a horizontal enabler capable of transforming productivity, safety, and sustainability across every marine sector.

Türkiye identifies the digital blue economy as a highly promising, cross-cutting sector. The country is actively exploring the integration of sensors, satellite data, electronic logbooks, AI-based fish stock assessments, and digital twins. For instance, DNA technologies, optical cameras, and RFID are highlighted as critical tools for modernizing aquaculture and ensuring product traceability (Country Report Türkiye, [20]). However, the primary barriers to scaling these technologies include weak commercialization pathways, a lack of sector-specific incubators, and limited venture capital.

For Georgia, maritime digitalization—including green port technologies, alternative fuels, and digital logistics solutions—will be increasingly relevant for its blue economy transition. However,

these concepts remain at an early stage, requiring stronger institutional coordination and investment to link public agencies with private port operators.

Conversely, sectors that involve chemically altering **seawater or exploiting deep-sea minerals** are experiencing deliberate stagnation across the western Black Sea.

In both Romania and Bulgaria, commercial **seabed mining** is entirely inactive. While the western Black Sea basin contains massive volumes of methane locked in shallow gas hydrates (estimated at over 14,000 megatons of carbon), any future extractive operations face severe hurdles (Burwicz-Galerie et al., 2024). The unique anoxic deeper layers of the Black Sea, the high risk of disturbing toxic hydrogen sulfide concentrations, and strict EU moratoriums on deep-sea mining mean that national policies are heavily skewed toward a precautionary approach. The primary relevance of seabed mining today is strictly spatial—ensuring that no future exploratory licenses conflict with established cable corridors or marine protected areas.

Desalination holds an extremely low priority as a commercial sector. Thanks to the massive freshwater influx provided by the Danube River, Romania's coastal and inland water demands are amply met, confining desalination to highly specialized industrial niches. In Bulgaria, there is minor research interest in small-scale desalination for water-stressed remote coastal communities (e.g., Shabla), but no commercial-scale activity exists or is planned.

Target groups matrix

Transitioning the Black Sea and regional maritime spaces from policy to practice requires a granular understanding of the diverse target groups operating within the blue economy. While the structural challenges vary by country, common themes—such as the need for decarbonization, digitalization, and balancing industrial activity with environmental protection—emerge across Romania, Bulgaria, Türkiye, and Georgia.

Romania's blue economy is highly industrialized, anchored by ports, logistics, and shipbuilding. While its direct statistical footprint is modest (roughly €1.5 billion in Gross Value Added, or 0.6% of GDP), its indirect multiplier effect is massive, ensuring regional energy security and facilitating foreign trade.

Table 15 – 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	Complex vessel repair, conversion, and specialized high-tech	Mitigating workforce contraction, pivoting from traditional bulk carriers to eco-friendly tonnage, and

	Shipyards Mangalia.	construction (offshore support, eco-ferries).	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	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

engineering
firms.

climate-induced shoreline
retreat.

Strategic transitions in Romania:

- The Industrial core: Geopolitical pressures have reconfigured regional supply chains, driving unprecedented transit cargo through Constanța. Heavy industry players are pivoting from traditional operations to high-tech engineering (e.g., shipyards acting as the supply chain backbone for offshore wind).
- The green transition: Driven by EU funding and the European Green Deal, private developers and research institutes are leading a shift toward marine renewable energy and blue biotechnology. The focus is shifting from purely extractive models to regenerative ones (e.g., restoring underwater forests).
- Economic vulnerability: Coastal tourism suffers from extreme seasonality (75% of visits in a short summer window). Similarly, fisheries rely heavily on a single invasive species (rapa whelk) for export, while local processors import 80% of their raw materials. Developing year-round tourism and expanding closed Recirculating Aquaculture Systems (RAS) are primary mitigation strategies.

Bulgaria's blue economy is built on a strong foundation of established maritime sectors—maritime transport, coastal tourism, and marine living resources. The primary challenge is not establishing economic relevance, but accelerating technological modernization, green/digital transitions, and workforce renewal.

Table 16: Blue economy sector mapping matrix

Sector	Tier	Development Priority	Key Actors
Fisheries and Aquaculture	1	High	EAFA, fishers' associations, mussel farms, MCB
Coastal and Maritime Tourism	1	High	Ministry of Tourism, coastal municipalities, tourism enterprises
Maritime Transport (Black Sea)	1	High	EAMA, ship owners' association, Naval Academy
Inland Waterway Transport (Danube)	1	High	EAEMDR, MTC, Danube port operators (Vidin, Lom, Ruse, Silistra)
Port Activities and Logistics	1	High	BPIC, Port Varna EAD, Port Burgas EAD
Shipbuilding and Ship Repair	1	High	Bulyard, MTG Dolphin, Odessos Shiprepair Yard, TEREM-KRZ Flotski Arsenal, KRZ Port Burgas, BNAKK
Marine Non-Living Resources	1	Low	Ministry of Energy, Chernomorski Solnitsi
Marine Renewable Energy	2	High	Ministry of Energy, MRDPW (MSP), BWEA
Marine Biotechnology	2	High	IO-BAS, VMU, biotech SMEs, MCB
Ocean Monitoring and Data	2	Medium	IO-BAS, MOEW, ExEA, Euro-Argo ERIC
Maritime Infrastructure	2	Medium	BPIC, MRDPW, cable operators
Marine Ecosystem Protection	3	High	MOEW, RIEW, IO-BAS, WWF Bulgaria
Blue Carbon / Coastal Wetland Habitats	3	Medium	IO-BAS, MOEW, Burgas/Pomorie municipalities, WWF Bulgaria

Waste Management / Pollution	3	High	MOEW, EAMA, coastal municipalities, NGOs
Seabed Mining	3	Low	Ministry of Energy (monitoring only)
Desalination	3	Low	Technical universities (research only)

Emerging sectors like marine renewable energy and ocean observation offer future diversification. However, Bulgaria must overcome regulatory and commercialization hurdles by forging stronger links between research institutions, public authorities, and entrepreneurship ecosystems.

Türkiye possesses robust established sectors and immense emerging potential. The TR90 Region and Black Sea coast have a distinctive profile driven by fisheries, Turkish salmon, logistics, port-city functions, and coastal-mountain tourism.

The overarching challenge for Türkiye is transitioning from volume to value—moving from raw production to value-added processing, from sheer visitor numbers to sustainable tourism, and from environmental compliance to active ecosystem health.

Sector-specific action areas:

- Aquaculture: Expand dedicated industrial zones, diversify the product portfolio toward higher value-added goods, improve digital traceability, and incentivize circular economy investments (e.g., collagen production from fish waste).
- Shipbuilding: Transition traditional boat builders toward high-tech production (electric vessels, luxury yachts), establish new coastal industrial zones, and expand blue-collar training facilities to develop human capital.
- Coastal tourism: Municipalities must invest in biological treatment centers to improve water quality and expand Blue Flag beaches. Public-private partnerships are needed to develop marinas and piers to foster water sports and sailing tourism, supported by local NGOs.

Georgia's blue economy is currently concentrated in traditional sectors: coastal/maritime tourism, maritime transport, ports, and fisheries. Emerging sectors (marine renewable energy, biotech, blue carbon, green port tech) remain in their infancy.

Sector-specific action areas:

- Tourism: Highly developed along the coast and in Adjara, but currently governed by sector-specific frameworks rather than integrated coastal management. The Tourism Strategy 2035 represents an opportunity to embed sustainability into destination governance.
- Ports & logistics: Strategically vital due to Georgia's role as a regional transit corridor. The Black Sea Submarine Cable Project significantly bolsters this by adding an energy interconnection component to Georgia's maritime space.
- Fisheries & aquaculture: Smaller in economic scale but critical for local food production. While a national aquaculture strategy has been approved, broader modernization and investment are still required.

- **Environmental protection:** Ecosystem management is treated largely as a separate policy domain. Long-term competitiveness across all Georgian maritime sectors relies on the resilience of the Black Sea ecosystem, necessitating stronger integration of environmental governance with economic planning.

Funding instruments for the blue economy

The realization of a sustainable, climate-neutral blue economy across the Black Sea basin is underpinned by a rapidly evolving, yet highly fragmented ecosystem of funding instruments. Historically driven by traditional subsidies for fisheries, port development, and maritime transport, the contemporary financial architecture of the region is undergoing a structural paradigm shift. Driven by international frameworks—most notably the Common Maritime Agenda (CMA) for the Black Sea, the European Green Deal, and global climate commitments—capital flows are increasingly being redirected toward ecological transitions, digital modernization, and climate resilience. This strategic repositioning is vital to de-risk technological innovation, scale sustainable practices, and bridge the gap between traditional maritime industries and emerging frontiers such as offshore renewables and blue biotechnology.

However, the operationalization of this financial transition varies significantly across the littoral states, revealing a multi-speed funding landscape characterized by distinct governance frameworks and varying degrees of international integration:

- **Romania** represents a highly mature model within the region, successfully transitioning from exclusive reliance on public grants to a multi-level, blended finance ecosystem. Anchored in the EU's 2021–2027 Multiannual Financial Framework, Romania effectively pairs pan-European research consortia and national operational programs with pioneering private-sector "blue finance" initiatives. This empowers stakeholders across the spectrum—from deep-tech marine startups to large-scale infrastructure developers—to align commercial objectives with regenerative environmental targets.
- **Bulgaria**, conversely, highlights the challenges of structural fragmentation despite having access to similar EU streams. The funding landscape is characterized by a high dependency on EU funds distributed across isolated, sectoral operational programs. In the absence of a unified national Blue Economy strategy, management remains split among separate authorities, limiting cross-sectoral coherence and preventing strategic, basin-wide investment prioritization.
- **Türkiye** showcases a robust but highly decentralized funding matrix, utilizing a vast array of national, EU, and international instruments. Because these resources are distributed through sectoral windows—such as rural development grants, regional innovation budgets, and investment incentives—they are rarely explicitly labeled as "blue economy" funds. The challenge for Turkish stakeholders is twofold: navigating this complex web to map instruments onto specific blue priorities, and building bankable project pipelines that blend grants, technical assistance, loans, and private equity.
- **Georgia's** financial architecture reflects its transitional, non-EU status, relying heavily on international financial institutions (IFIs) and bilateral development aid. Georgian blue finance is heavily anchored in global environmental initiatives, such as the World Bank's

Blueing the Black Sea (BBSEA) program, complemented by targeted access to EU cross-border cooperation programs. To progress, Georgia must move away from standalone, donor-driven grants and build institutional capacity to connect local micro-enterprises—like small-scale aquaculture and eco-tourism—with international private capital.

Despite these divergent national frameworks, a unifying challenge binds the Black Sea region: the critical need to transition from fragmented, public-sector reliance to a cohesive, blended finance model. To unlock the region's true maritime potential, institutions must collaboratively develop cross-border, bankable project pipelines that successfully marry public grants with private investment, ensuring that economic growth directly reinforces the ecological restoration of the shared Black Sea basin.

National funding programs and sub-sectoral allocation

The operationalization of blue economy priorities relies heavily on a complex matrix of domestic instruments, EU structural co-financing, and international donor streams. While some nations have established highly integrated, sector-specific blueprints, others continue to manage blue growth through a decentralized array of conventional operational and regional programs.

Romania - blended governance and deep structural modernization

Romania's national funding landscape is the most structurally integrated in the region, characterized by a deliberate shift away from volume-driven capacity expansion toward ecological sustainability, digital tracking, and infrastructural decarbonization.

- **The Aquaculture and Fisheries Program (PAP) 2021–2027:** Capitalized at €232 million (combining €162.4 million from the EU's EMFAF with nearly €70 million in domestic co-financing), PAP serves as the core financial pillar for maritime primary production. The program effectively ties capital injections to strict environmental compliance under the Common Fisheries Policy (CFP). Rather than expanding fleet sizes, it subsidizes low-impact operations, energy-efficient propulsion, and green processing utilities (e.g., solar arrays). A significant €108 million is explicitly directed toward climate adaptation, driving investments in Recirculating Aquaculture Systems (RAS) to minimize nutrient runoff, funding R&D for temperature- and salinity-resilient species, and modernizing facilities for organic-certified processing. Crucially, PAP utilizes the Community-Led Local Development (CLLD) model, channelling funds directly to Fisheries Local Action Groups (FLAGs) to build alternative livelihoods in coastal eco-tourism and artisanal markets, relieving ecological pressure on vulnerable wild stocks like sturgeon and turbot.
- **The National Recovery and Resilience Plan (PNRR):** Operating as a rapid-deployment mechanism for structural reforms, the PNRR targets the green and digital transformation of maritime transport nodes. Interventions are concentrated on the Trans-European Transport Network (TEN-T), specifically the modernization of the Port of Constanța. Key allocations target "cold ironing" infrastructure (onshore power supply allowing docked vessels to bypass auxiliary diesel engines), the implementation of an integrated Port Community System to streamline cargo flows via automated logistics, and the rehabilitation of internal port rail networks to switch high-emission road freight over to sustainable rail and inland Danube barges.
- **The Sustainable Development Program (SDP / PDD) 2021–2027:** Backed by the EU Cohesion Fund, the SDP operates as the primary engine for large-scale environmental

engineering and coastal resilience. It finances Integrated Coastal Zone Management (ICZM) mega-projects, utilizing offshore dredged sand for extensive beach nourishment across vulnerable tourist sectors (Constanța, Mamaia, Eforie), reinforced by submerged breakwaters to counter climate-induced storm surges. Concurrently, it funds municipal wastewater treatment upgrades along the littoral zone to halt terrestrial nutrient runoff from compromising marine biodiversity and aquaculture concessions.

- **Complementary Energy, Regional, and Scientific Funds:**
 - *Modernisation Fund:* Capitalized via the EU Emissions Trading System (EU ETS) and managed by the Ministry of Energy, this pool finances the vital onshore grid infrastructure and high-voltage submarine cable capacities required to support Romania's upcoming Black Sea offshore wind auctions.
 - *South-East Regional Program (PR Sud-Est):* A decentralized €1.5 billion fund that provides dedicated grants and subsidized loans to coastal micro-enterprises and SMEs in Constanța and Tulcea, bridging the gap for regional tech transfers and eco-tourism startups.
 - *PNCDI IV (2022–2027):* Managed through UEFISCDI, this national research plan provides the domestic matching capital for exploratory marine science, backing early-warning systems, hydrodynamic modeling, and blue carbon assessments led by institutes like INCDM ("Grigore Antipa") and GeoEcoMar.
 - *Environmental Fund Administration (AFM) & CEF Transport:* The AFM uses domestic eco-taxes to fund localized coastal remediation and municipal green transitions, while the Connecting Europe Facility (CEF) injects heavy-duty transnational capital directly into Constanța's multi-million euro berth electrification projects.

Bulgaria - high EU dependency and fragmented programmatic delivery

Unlike Romania, Bulgaria does not have a unified national funding program explicitly dedicated to the cross-cutting sectors of the blue economy. Instead, financial delivery is fragmented across general EU-funded operational programs, managed by disparate ministries with minimal structural cross-talk. Direct state allocations—administered via the Ministry of Transport and Communications (MTC) and the Ministry of Agriculture and Food (MAF)—are largely restricted to regulatory, control, and baseline matching infrastructures without publicly disaggregated data.

- **Program "Competitiveness and Innovation in Enterprises" (PCIE) 2021–2027:** Funded through the ERDF, this program acts as a primary lifeline for private maritime operators. It finances SME modernization, circular economy models, and energy efficiency upgrades across shipbuilding supply chains, port services, marine tech developers, and coastal hospitality providers.
- **Program "Research, Innovation and Digitalisation for Smart Transformation" (RIDST) 2021–2027:** This instrument underpins Bulgaria's marine science and smart transformation agendas, funding ocean observation infrastructures, digital twin components, and business-science research partnerships. Human capital shortages across these high-tech and traditional maritime sectors are concurrently addressed via target-driven upskilling and vocational training grants under the **Program "Education"** and **Program "Human Resources Development" (HRD)** funded by the ESF+
- **Program "Environment" 2021–2027 & Program "Regional Development" 2021–2027:** The former finances marine biodiversity conservation and ecosystem monitoring inside protected zones. The latter serves as the main driver for municipal and regional public infrastructure. By utilizing Integrated Territorial Investments (ITI) realized

through Municipal Integrated Development Plans, it allows local authorities in coastal hubs like Varna and Burgas to bundle projects spanning waterfront regeneration, cultural heritage valorization, and climate adaptation into a singular financial approach.

- **Program "Transport Connectivity" 2021–2027:** With a total budget of roughly €1.9 billion, this ERDF and Cohesion Fund instrument complements the transnational CEF by focusing on non-core TEN-T ports and operational equipment upgrades. Priority 3 (€403 million) targets intermodality, maritime safety, and low-emission port assets. A prime operational example is the Port of Varna EAD project, which utilizes this program to acquire zero-emission cargo-handling equipment and rehabilitate intra-port rail systems, circumventing its limited access to direct CEF streams.

PMFA 2021–2027 & The Recovery and Resilience Plan (RRP): The Program for Maritime Affairs, Fisheries and Aquaculture (PMFA), managed by EAFA, remains the traditional sector-specific tool for fishing communities and FLAG-driven diversification. Concurrently, the time-limited RRP provides rapid funding for short-term port digitalization and green infrastructure. However, its effectiveness is constrained by tight implementation timelines and the absence of an integrated cross-sectoral Blue Economy roadmap, leaving regional strategies (such as the Burgas Blue Growth Strategy 2024–2030) to align RRP funding opportunities with emerging marine biotechnology projects.

Türkiye - decoupled sectoral windows and regional cluster drivers

Türkiye boasts a highly dynamic, well-capitalized funding matrix. However, it operates under a distinct structural characteristic: funding instruments are rarely explicitly branded as "blue economy" assets, requiring stakeholders to actively navigate various decoupled sectoral windows.

- **Ministry of Agriculture and Forestry & IPARD III:** Direct public support is channeled through target-specific windows, focusing heavily on aquaculture species-based support schemes (specifically targeting high-value commodities like Turkish salmon, trout, sea bream, sea bass, carp, and tilapia) and processed fisheries subsidies. The structural modernization of these value chains is significantly augmented by the Agriculture and Rural Development Support Institution (TKDK) via the **IPARD III Program (2021–2027)**. Armed with a €403 million budget, IPARD III funds cold-chain logistics, processing facility upgrades, value-added packaging, and rural enterprise diversification in coastal areas where maritime primary production dominates local economies.
- **Decentralized Development Agencies & Clustering:** Regional development agencies play a critical orchestrating role in Türkiye's decentralized model. In the Eastern Black Sea (TR90 Region), the **Eastern Black Sea Development Agency (DOKA)** acts as a primary coordinator. Rather than just distributing funds, DOKA actively builds blue economy project pipelines, finances regional feasibility studies, coordinates marine cluster governance, and designs scalable pilot operations linking local chambers of commerce with broader international streams.
- **R&D, Commercialization, and Export Promotion:**
 - *TÜBİTAK & Ministry of Industry and Technology:* These instruments fund industrial-academic cooperation, targeting applied technologies such as AI-driven stock assessments, specialized marine monitoring sensors, green shipping innovations, port digitalization, and algae-based marine biotechnology.
 - *Ministry of Trade (UR-GE & Export Supports):* Designed to bolster internationalization, these instruments fund market-access initiatives,

international trade fairs, and export-readiness clusters. This targeted support directly assists seafood exporters, shipbuilders, yacht manufacturers, and marine equipment providers in entering competitive global markets.

- **Public-Private Partnerships (PPPs):** For large-scale infrastructure, Türkiye relies extensively on PPP models with embedded sustainability metrics to finance the construction, expansion, and green operational upgrading of major commercial ports, commercial marinas, and high-capacity logistics hubs.

Georgia - internationalized donor dependency and emerging research frameworks

Georgia's financial framework is structurally defined by its non-EU, transitional status. Lacking access to structural cohesion funds, its blue economy activities are heavily dependent on international financial institutions (IFIs), global environmental facilities, and fragmented domestic sectoral budgets.

- **Tourism and Regional Infrastructure Fragmentation:** Public support for Georgia's primary blue driver—coastal tourism—is split across multiple agencies with differing structural mandates. The **Georgian National Tourism Administration (GNTA)** under the Ministry of Economy and Sustainable Development focuses entirely on destination marketing, service quality improvements, and tourist product diversification. Conversely, the heavy civil infrastructure underwriting these coastal destinations (roads, municipal grids, water/sanitation systems in the Black Sea littoral zone) is managed separately by the **Ministry of Regional Development and Infrastructure (MRDI)**. Private-sector investments are incentivized via **Enterprise Georgia** (transitioning into the Georgian Economic Development Corporation JSC), which provides business development incentives and investment promotion. However, this matrix remains heavily growth-oriented, lacking structural integration into integrated coastal zone management or broader marine conservation policies.
- **The Emergence of Labeled Blue R&I Instruments:** While historically absent, dedicated national funding for the blue economy began to crystallize through the Ministry of Education, Science and Youth and the **Shota Rustaveli National Science Foundation of Georgia (SRNSFG)**.
 - *“Black Sea Blue Development” Grant Competition:* Launched as a breakthrough national initiative, this dedicated funding line explicitly finances research aligned with the Black Sea Strategic Research and Innovation Agenda (SRIA). Supported projects target tangible blue economy bottlenecks, including AI-based eco-monitoring for the Poti coastal region, riverine toxic metal transport assessments, wetland risk mitigation, and coastal cultural heritage preservation.
 - *International Mainstreaming:* In 2025, SRNSFG expanded its structural reach by partnering with the **EU Sustainable Blue Economy Partnership**, co-funding calls centered on ocean digital twins, blue bioresources, marine multi-use infrastructures, and maritime digitalization frameworks. This is complemented by the **Georgian Innovation and Technology Agency (GITA)**, which provides horizontal startup grants that, while not explicitly blue, are increasingly tapped for localized environmental technologies and maritime data systems.
- **Environmental Management and Transit Connectivity:**

- *MEPA & IFI Alignment:* Climate adaptation, water quality monitoring, and marine protected area management are centralized under the **Ministry of Environmental Protection and Agriculture (MEPA)**. However, because domestic budgets are constrained, these programs are consistently tied to global donor instruments, notably the World Bank's *Blueing the Black Sea* (BBSEA) initiative financed by the Global Environment Facility (GEF).
- *Transit Infrastructure:* Large-scale maritime transport and connectivity investments are closely tied to Georgia's geopolitical position as a regional transit hub. Coordinated through the MRDI and the Ministry of Economy and Sustainable Development, these investments focus heavily on port modernization, structural logistics networks, and land-to-sea connectivity projects designed to secure Georgia's role within the Middle Corridor trade routes. The central institutional challenge remains transitioning these project-based, donor-dependent streams into a sustained, blended national blue finance ecosystem.

Table 17: Summary matrix of national funding instruments

The following mapping outlines the primary domestic and co-financed instruments driving blue economy development across the target states:

Country	Primary funding instrument	Managing authority agency	Strategic blue / economy focus	Financing model
Romania	Aquaculture & Fisheries Program (PAP)	Ministry of Agriculture / EAFA	Low-impact fleets, RAS aquaculture, FLAG livelihoods, marine litter removal	Blended (EMFAF + National Co-financing)
	PNRR & CEF Transport	Ministry of Transport / Port Authorities	Port of Constanța decarbonization, cold ironing, intermodal rail logistics	Direct Grants / EU Recovery Funds
Bulgaria	Transport Connectivity & PCIE	Ministry of Transport / Ministry of Innovation	TEN-T port upgrades, SME circular economy, zero-emission cargo gear	EU Operational Programs (ERDF / Cohesion)
	PMFA 2021–2027	Ministry of Agriculture and Food / EAFA	Traditional fisheries modernization, aquaculture, coastal community diversification	Blended (EMFAF + National Co-financing)
Türkiye	MoAF & IPARD III Windows	Ministry of Agriculture / TKDK	Species-specific aquaculture, value-added	Sectoral Subsidies / EU Pre-accession Funds

					processing, cold-chain logistics				
		Development Agencies (e.g., DOKA)		Ministry of Industry and Technology	TR90 blue cluster building, feasibility pilots, tech integration			Regional Development Allocations	
Georgia	SRNSFG Calls	Blue	Shota Rustaveli Science Foundation		Black Sea alignment, eco-monitoring, Partnership	Sea coastal AI EU integration	SRIA	National Grants / Partnership Match	R&I EU
	BBSEA MEPA Frameworks	&	Ministry of Environment / World Bank		Coastal erosion control, pollution monitoring, protected areas management			IFI Loans / Global Environmental Grants (GEF)	

European funding instruments

While national structural funds provide the baseline for maritime infrastructure, the most advanced technological, ecological, and cross-border innovations in the Black Sea basin are financed through centralized European and international mechanisms. Because marine ecosystems, ocean currents, and pollution do not respect political borders, these instruments emphasize transnational consortiums. They require research institutes, startups, municipalities, and large enterprises from EU Member States (Romania, Bulgaria) to collaborate directly with fully associated and partner countries (Türkiye, Georgia) to bridge the gap between early-stage marine research and full-scale commercialization.

The primary vehicles for regional cohesion are the Interreg programs, which mandate cross-border partnerships to address shared ecological and economic challenges.

Interreg NEXT Black Sea Basin Programme 2021–2027

Hosted administratively in Constanța, Romania, this mechanism manages a regional budget of approximately €72 million. It is the most critical instrument for direct cooperation between EU and non-EU Black Sea states (including Georgia, Türkiye, Ukraine, and Moldova).

- **Priority 1: A Blue and Smart Region.** Finances the digital transformation of maritime sectors. Grants support shared intelligent ocean monitoring platforms, AI forecasting for Black Sea hydro-dynamics, and joint research into sustainable, low-impact aquaculture.
- **Priority 2: A Clean and Green Region.** Tackles anthropogenic pressures through joint early-warning systems for marine pollution (oil spills, agricultural runoff, marine plastics) and biodiversity conservation for transboundary habitats and migratory species like Black Sea cetaceans.
- **Socio-Economic Resilience:** Provides capital for "people-to-people" actions, enabling local SMEs to develop cross-border eco-tourism routes linking the Danube Delta with protected areas in Bulgaria and Georgia, reducing reliance on seasonal beach tourism.

Interreg Danube Region Programme 2021–2027

Recognizing the "source-to-sea" dynamic, this €215 million fund addresses the fluvial blue economy. It finances low-carbon inland waterway transport and supports consortiums (such as the Microdrink project) to intercept microplastics and industrial pollutants along the river corridor before they reach the Black Sea.

Horizon Europe & Mission Ocean

The European Union's flagship research framework is the primary engine for de-risking bleeding-edge maritime technologies. Türkiye and Georgia actively participate in these highly competitive consortiums alongside Bulgarian and Romanian research hubs.

As the EU's €95.5 billion flagship research framework, Horizon Europe is critical for developing and testing bleeding-edge maritime technologies. Both Türkiye (fully associated) and Georgia actively participate alongside EU members Romania and Bulgaria.

- **Cluster 5 (Climate, Energy, Mobility):** Finances the "heavy tech" transition, including alternative marine fuels, zero-emission vessels, and deep-water floating offshore wind optimization (such as the BLOW project off the Romanian coast).
- **Cluster 6 (Food, Bioeconomy, Natural Resources):** Drives biological research, enabling institutes to pioneer climate-resilient seafood production and marine biotechnology.
- **Mission "Restore Our Ocean and Waters":** The Danube & Black Sea Lighthouse treats the entire water column as a contiguous ecosystem. Through multi-million-euro Innovation Actions (like DaWetRest and DALIA), it funds "blue-green infrastructure" rather than concrete engineering. It mandates Living Labs—real-world testing grounds where solutions like zero-emission ferries and bio-based filtration are validated before market entry.

Operating under Horizon Europe, this initiative departs from traditional concrete-and-steel engineering, focusing instead on "blue-green infrastructure".

- **The Danube & Black Sea Lighthouse:** Treats the water column from the Black Forest to the Romanian coastline as a single ecosystem. It deploys millions in Innovation Actions (IAs) to pilot nature-based solutions.
- **Flagship Projects:** Include **DaWetRest** (a €9.1 million initiative in the Danube Delta developing sustainable local bio-resources like reeds for carbon sequestration) and **DALIA** (a 22-partner project deploying digital pollution monitoring tools).
- **Living Labs:** Mandatory testing grounds where scientists, deep-tech startups, and citizens co-create solutions—such as zero-emission local ferries or bio-based filtration—bridging the "valley of death" before commercialization.

The LIFE Programme

The dedicated financial engine for environmental and climate action, LIFE focuses strictly on ecological preservation rather than commercial extraction.

- **Nature and Biodiversity:** Funds the management of Natura 2000 marine sites, the restoration of migratory routes (e.g., sturgeon in the Danube estuary), and the reduction of accidental cetacean bycatch.
- **Climate Adaptation:** Supports coastal municipalities in implementing nature-based solutions to mitigate intensifying storm surges and salinity intrusion.

Connecting Europe Facility (CEF)

CEF is the principal instrument for modernizing maritime transport within the Trans-European Transport Network (TEN-T). In Bulgaria, it has been instrumental for the ports of Burgas and Varna—funding the REBIRTH28 project, which delivered a new deep-water berth, rail upgrades, and shore-side electricity. Future CEF funding is heavily targeted at onshore power supply (OPS) and alternative fuel bunkering to meet maritime decarbonization mandates.

Digital Europe Programme (DEP)

DEP finances the digital backbone required to integrate national data into the European Digital Twin of the Ocean (EDTO). It allows local research hubs to leverage supercomputing and predictive modelling for complex simulations, such as forecasting commercial fish stock migrations or oil spill trajectories.

The EU Innovation Fund & I3 Instrument

- **Innovation Fund:** Targets hard-to-abate sectors by funding massive capital expenditure for utility-scale offshore wind farms, green hydrogen production, and synthetic maritime fuel manufacturing in commercial ports.
- **Interregional Innovation Investments (I3):** Supports the commercialization and scale-up of sustainable solutions by integrating Blue Economy SMEs into broader European value chains.

Digital Europe Programme (DEP) & Capacity Building

- **DEP:** Finances the supercomputing and AI integration required to plug national ocean monitoring data into the European Digital Twin of the Ocean (EDTO), enabling complex predictive modeling for oil spills and fish stock migrations.
- **Erasmus+:** Crucial for capacity building, academic mobility, and blue skills development, particularly leveraged by Türkiye and Georgia to strengthen institutional capabilities.
- **EIT Water (KIC):** Formally launched in November 2025 (with up to €5 million in startup grants for 2026), this Knowledge and Innovation Community addresses water scarcity and marine ecosystem degradation, with Bulgaria acting as the Black Sea Regional Hub.

Private capital and institutional finance

While public grants and European funds are essential for de-risking early research and building baseline infrastructure, they cannot finance the full commercialization of the blue economy alone. Reaching the scale required for an industrial and ecological transition depends heavily on private capital and international financial institutions.

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 Blueprint:** In a landmark move for the region, the International Finance Corporation provided a €100 million "Blue Loan" to Banca Transilvania in Romania—the first dedicated blue financing facility in Central and Eastern Europe. This capital pool funds water-centric projects, such as helping coastal hotels upgrade sustainable water systems and financing advanced wastewater treatment for manufacturing plants.
- **EBRD Green Economy Financing Facility (GEFF):** Working through local commercial banks, GEFF leverages private institutional capital to fund green transitions, such as accessible loans to upgrade fluvial fleet engines or install solar power on aquaculture processing plants.

Corporate capital and heavy industry

For sectors like offshore energy, the required capital expenditure (CAPEX) is so vast that it relies primarily on the balance sheets of massive private and semi-private energy corporations.

- **Offshore Infrastructure:** In Romania, the €4.7 billion development of the Neptun Deep gas field by OMV Petrom and Romgaz injects private capital that physically builds the offshore supply chain—subsea flowlines, construction vessels, and local engineering expertise. This same private supply chain is expected to pivot toward building the planned 3 to 7 GW of offshore wind capacity, financed by global private energy developers bidding for concessions.

Venture Capital (VC) and Private Equity

For deep-tech marine startups and innovators, traditional bank loans are often too rigid. Venture capital bridges the gap between lab prototypes and commercial products.

- **BlueInvest and EU Frameworks:** The European Commission's BlueInvest platform acts as a matchmaker, providing investment-readiness coaching and connecting blue-tech startups with European VC firms. The European Investment Fund (EIF) supports 10 dedicated Blue Economy funds as a Limited Partner, providing anchor capital.
- **Regional Imbalances:** However, the European private investment market for the Blue Economy is highly concentrated in Western and Northern Europe. According to the BlueInvest Investor Report 2026, Bulgaria is not listed among investor-attractive countries, and the Black Sea basin's VC ecosystem remains in its infancy compared to hubs in France, the Netherlands, and Spain.

Public-Private Partnerships (PPPs)

PPPs are highly relevant for modernizing ports, marinas, coastal tourism infrastructure, and wastewater facilities. In Türkiye, private investment already drives ports, logistics terminals, shipyards, and aquaculture farms. However, successful PPPs require clear project preparation, viable revenue models, and long-term risk-sharing arrangements, which remain underdeveloped in emerging sectors like marine biotechnology or offshore wind across the broader basin.

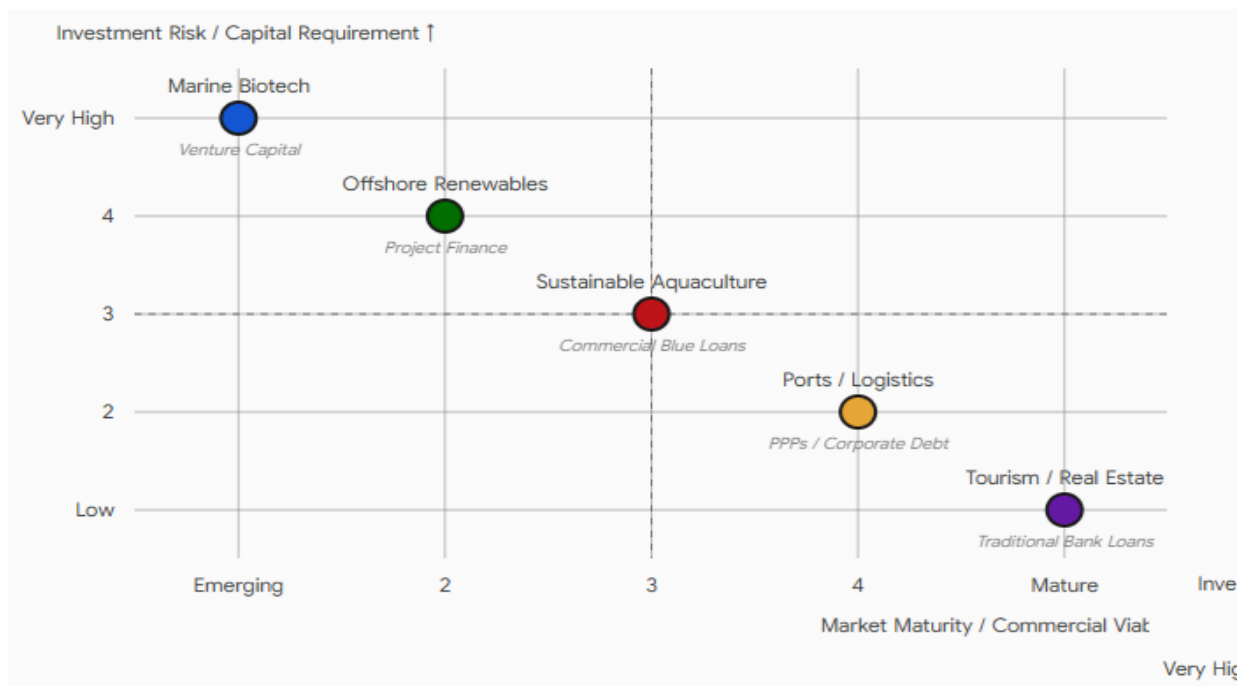


Figure 2 – Blue economy investment matrix

Accessibility, funding gaps, and barriers

Despite the availability of multiple national, European, and private financing mechanisms, access to funding across the Black Sea basin remains uneven, fragmented, and heavily skewed toward established commercial sectors.

A primary constraint for both the private sector and research institutions is the sheer administrative burden of accessing funds. Complex application procedures, stringent reporting requirements, and bureaucratic delays create significant disincentives. This fragmentation is exacerbated when multiple managing authorities administer relevant EU funds without an inter-ministerial coordination mechanism targeting the blue economy holistically.

The principal bottleneck for accessing mechanisms like EMFAF, BlueInvest, and Horizon Europe is often not the absence of funds, but the limited capacity of regional SMEs and municipalities to develop bankable project proposals. SMEs frequently lack proposal-writing capacity, co-financing reserves, technical feasibility studies, and foreign-language capabilities necessary to navigate highly competitive, centralized European grants.

Commercial bank lending to blue economy innovation sectors is extremely limited. Banks have a low-risk appetite for pre-commercial or early-stage marine technology ventures. While instruments like the EBRD GEFF exist, there is a structural lack of private sector liquidity for mid-sized operators who require funding for green retrofits or processing investments but fall below the threshold for massive corporate debt and lack the high-growth profile required for Venture Capital.

A major characteristic of the current landscape, particularly in Georgia and Bulgaria, is the strong dependence on externally funded, donor-supported initiatives. Because these programs are frequently project-based and limited in duration, they create challenges for continuity and the long-term institutionalization of project outcomes once the funding cycle ends.

Traditional sectors (tourism, transport, port infrastructure) receive comparatively strong financial support due to their commercial viability. In contrast, critical emerging sectors remain significantly underfunded. Significant funding coverage gaps exist in:

- **Marine renewable energy:** Lacks national co-financing schemes for feasibility studies and regulatory frameworks (like zone designations).
- **Marine biotechnology:** Lacks dedicated national research-to-market programs, marine biobanks, or shared infrastructure funds.
- **Maritime decarbonization:** Lacks dedicated support schemes for green vessel retrofits or uncompensated EU ETS compliance costs for SME operators.
- **Ocean monitoring:** Suffers from limited operational budgets for national marine data centers and continuous environmental monitoring.

Ultimately, the most pressing funding gap is not a lack of individual capital sources, but the absence of a coordinated, cross-sectoral financing framework that connects available instruments into a single, cohesive blue economy investment pipeline.

Stakeholder consultation results

The blue economy is a fundamental driver of sustainable economic development, environmental resilience, and cross-border cooperation within the Black Sea basin. This chapter provides a comprehensive analysis of a targeted stakeholder consultation conducted under the BlueDial project, an initiative financed by the Interreg NEXT Black Sea Basin Programme.

The primary mission of this consultation is to systematically map and evaluate the institutional, legal, and strategic frameworks—as well as the financial instruments—that currently underpin the blue economy and the Common Maritime Agenda (CMA) across the region. This chapter synthesizes direct insights from key local, national, and regional stakeholders across Romania, Bulgaria, Türkiye, and Georgia.

The primary objectives of this analysis are to:

- Evaluate sectoral potential by assessing the current capacity, readiness, and future potential of the maritime and coastal economic sectors across the participating Black Sea nations.
- Identify structural gaps by pinpointing existing deficiencies, barriers, and bottlenecks within the legal, strategic, and institutional frameworks governing the regional blue economy.
- Highlight actionable improvements by defining concrete areas where national blue economy policies can be enhanced and harmonized to foster better alignment, shared resilience, and deeper cooperation among regional partner countries.

In total, the survey garnered 60 responses from a diverse range of regional actors. The geographical distribution of the respondents reflects active participation across the basin, with the highest engagement from Bulgaria (27 respondents), followed by Georgia (13 respondents), Romania (11 respondents), and Türkiye (9 respondents).

The survey successfully captured insights from a wide spectrum of institutional perspectives. The largest segments of respondents represent **Academia and Research Institutions** (18 respondents) and **National Governments/Ministries** (17 respondents), highlighting a strong focus on policy and research within the region. Additionally, the private sector is represented by **Private Enterprises and Businesses** (8 respondents), alongside input from **Local Authorities** (5 respondents) and **NGOs/Civil Society organizations** (5 respondents). A small number of responses also came from regional bodies, industry associations, and mixed-type organizations. This multi-sectoral participation ensures that the subsequent analysis reflects a balanced,

well-rounded view of the strategic priorities, challenges, and opportunities defining the Black Sea's blue economy.

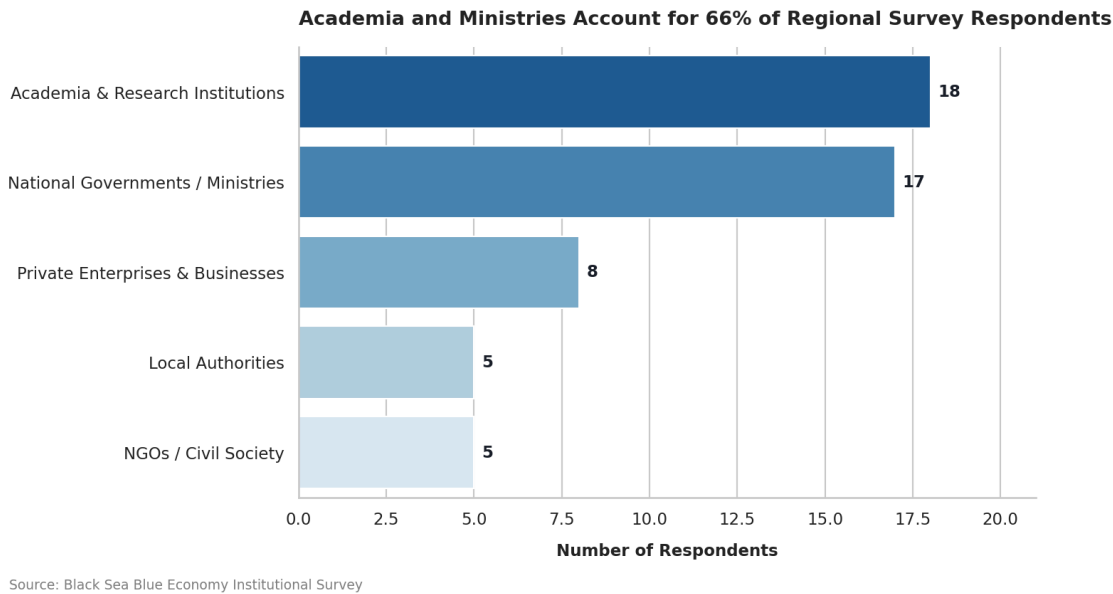


Figure 3 - Organisation type

Based on the analysis of stakeholder responses, the blue economy ecosystem in the Black Sea region exhibits strong engagement across a diverse range of sectors, with a clear dominance of traditional maritime activities and environmental sustainability efforts. The highest level of direct organizational engagement is observed in **maritime transport**—encompassing shipping, shipbuilding, ports, logistics, and supporting services—which accounts for **50.8%** of respondent activity. Environmental stewardship is also a major focus, highlighted by substantial participation in **waste management and pollution control (42.4%)** and **marine ecosystem protection and restoration (39.0%)**. Other vital sectors remain highly relevant, with **marine living resources** (fisheries and aquaculture) and **ocean data monitoring** each engaging **30.5%** of the organizations, followed closely by **coastal and maritime tourism at 28.8%** and the **maritime security and surveillance sector at 20.3%**. Meanwhile, emerging and specialized fields currently show lower direct stakeholder engagement, including **marine biotechnology (11.9%)**, **marine renewable energy (6.8%)**, **marine non-living resources (5.1%)**, and **blue carbon initiatives (5.1%)**. In addition to these primary categories, open-ended responses reveal targeted niche involvements in areas such as maritime spatial planning, integrated coastal zone management, SME entrepreneurship support, alternative marine fuels, and AI-driven earth observation for climate change tracking. Overall, this distribution underscores a transitional phase for the region's blue economy, where established transport and environmental conservation initiatives form the core focus, while newer, innovative sub-sectors are still developing their operational footprint.

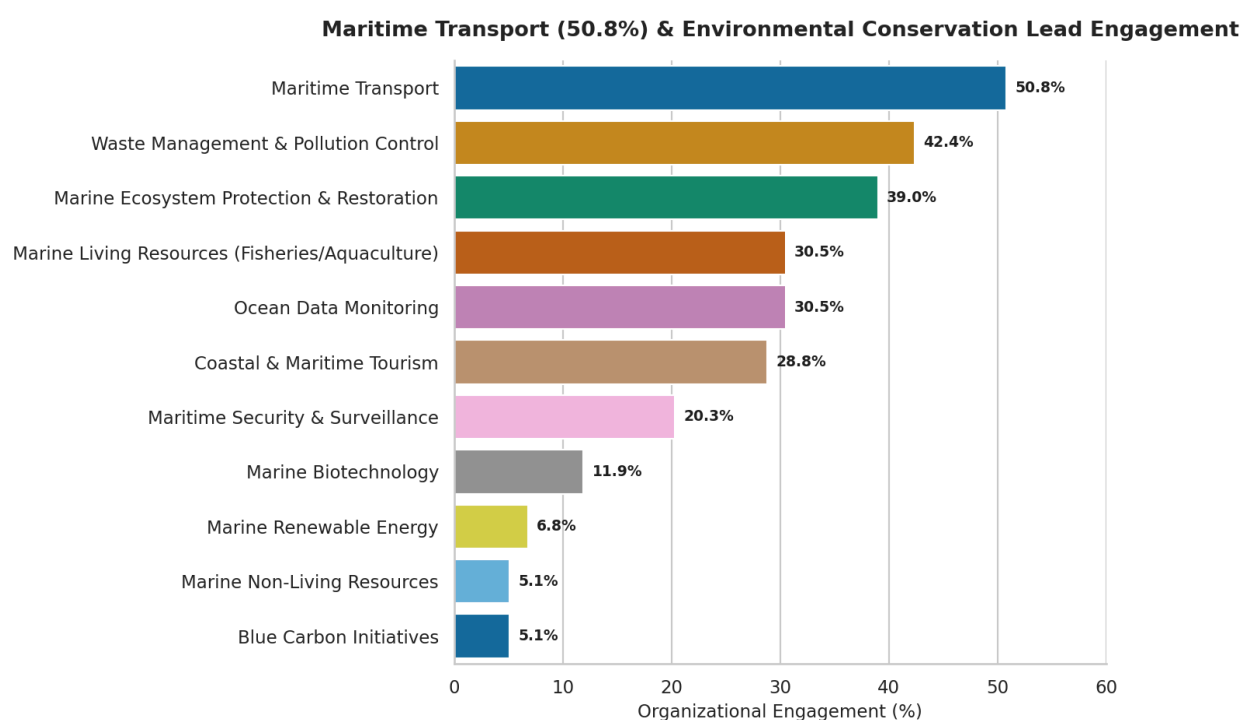


Figure 4 - Primary blue economy sectors (Q5)

A critical component of advancing the blue economy in the Black Sea region is the strength and maturity of the national strategic frameworks guiding it. To understand the current policy landscape, stakeholders were asked to rate the maturity of their country's blue economy framework on a scale from 1 (Non-existent) to 5 (Highly developed and integrated) and to identify the primary drivers or barriers influencing their assessment.

The perceived maturity of national strategic frameworks for the blue economy is predominantly moderate to underdeveloped, reflecting a regional average score of 2.95 out of 5. The vast majority of stakeholders (73%) rated their national frameworks a 2 or 3, indicating that while foundational policies and sectoral regulations exist—often driven by compliance with EU regulatory requirements, international conventions, and available European funding mechanisms—a holistic and unified approach is severely lacking. Qualitative feedback reveals that the most significant barrier is profound institutional fragmentation; policies are siloed across multiple ministries (e.g., transport, environment, agriculture) without effective coordination mechanisms or a shared long-term vision. Additional critical constraints include administrative bottlenecks, lack of specialized technical capacity within state institutions, complex and rigid regulatory procedures (especially regarding environmental mandates versus infrastructure development), and unstable political climates that hinder continuous strategic oversight. Conversely, localized financial instruments (such as the ITI mechanism) and mandatory international agreements serve as the primary positive drivers, pushing forward localized ecosystem management and transport network compliance despite the overarching fragmented governance.

Based on an analysis of stakeholder feedback across the region, the regulatory and strategic landscape guiding the blue economy is driven by a mix of national legislation, European directives, and regional frameworks, though a singular, comprehensive blue economy strategy remains absent in most countries. In **Bulgaria**, stakeholders frequently cite the *Marine Strategy (2022–2027)* and the *Maritime Spatial Plan (2021–2035)*, alongside the *Maritime Affairs*,

Fisheries and Aquaculture Programme (2021–2027) and the *Maritime Spaces, Internal Waterways and Ports Act*, as the primary pillars of their national framework. In **Romania**, critical policies include the *National Sustainable Development Strategy 2030* (and its SDG 14 targets), the *Integrated Coastal Zone Management Strategy*, the *Maritime Spatial Planning Law (No. 88/2017)*, and regional financial instruments such as the *Integrated Territorial Investments (ITI)* mechanism for the Danube Delta. In **Türkiye**, governance relies heavily on foundational legislation such as the *Coastal Law (No. 3621)*, the *Environmental Law*, and the *Fisheries Law*, with future alignment anticipated through the prospective *Sustainable Blue Economy Action Plan* linked to the nation's 2053 targets. Similarly, in **Georgia**, there is no consolidated blue economy document; instead, the sector is steered by the *Maritime Code of Georgia*, the *National Environmental Action Programme*, and recent aquaculture and fisheries legislation. Across all countries, international and regional initiatives—most notably the *Common Maritime Agenda for the Black Sea (CMA)*, the *Marine Strategy Framework Directive (MSFD)*, and the *European Green Deal*—serve as essential external drivers that shape and unify national efforts toward sustainable maritime development.

Based on the stakeholder responses regarding Question 9 and its follow-ups, national blue economy strategies in the Black Sea region exhibit moderate to strong alignment with the goals of the Common Maritime Agenda (CMA), with the strongest alignment observed in Goal 1 (Healthy marine and coastal ecosystems), which scored an average of 3.43 out of 5. Goal 2 (A competitive, innovative, and sustainable blue economy) and Goal 3 (Fostering investment) scored 3.18 and 3.07, respectively. Qualitative feedback reveals that the highest alignment occurs at the policy level—driven by mandatory transposition of European directives, such as the Marine Strategy Framework Directive, and participation in international initiatives—resulting in consistent practices for environmental protection, maritime transport, and sustainable coastal management. However, significant disconnections emerge in the practical implementation and mobilization of investments (Goals 2 and 3). Respondents point to a distinct lack of comprehensive national strategies, specialized financial instruments, and coordination mechanisms capable of bridging the gap between scientific research and commercial application. As a result, while traditional sectors like shipping and tourism are well-regulated, emerging sectors—such as marine biotechnology, offshore renewable energy, and blue carbon—struggle to scale up beyond project-based European funding, highlighting a critical need for targeted national investment policies and stronger institutional synergies.

Based on the responses to Question 10 regarding stakeholder familiarity with EU strategies and frameworks related to the blue economy, there is a relatively high level of awareness of overarching regional and sustainability-focused initiatives, though familiarity with specialized sectoral strategies remains lower. Among the 60 respondents, the most widely recognized framework is the **Common Maritime Agenda for the Black Sea**, cited by **63.3%** of stakeholders, followed closely by the **EU Sustainable Blue Economy Strategy** at **56.7%**. Frameworks focused on planning and environmental protection also show solid recognition, with the **Maritime Spatial Planning Directive (43.3%)**, the **Marine Strategy Framework Directive (41.7%)**, and the **European Ocean Pact (40.0%)** being moderately well-known.

Strategic initiatives targeting specific missions or geopolitical contexts—such as the **EU Strategic Approach to the Black Sea Region (38.3%)** and the **EU Mission: Restore our Ocean and Waters (35.0%)**—occupy the middle tier of awareness. In contrast, highly targeted or specialized strategies exhibit the lowest levels of familiarity, including the **EU Ports Strategy (25.0%)**, the **EU Maritime Security Strategy (23.3%)**, and the **EU Industrial Maritime**

Strategy (21.7%). Notably, **11.7%** of respondents indicated that they are not familiar with any of the listed frameworks. In the open-ended feedback, a few stakeholders highlighted additional relevant frameworks they follow, such as the Strategic Research and Innovation Agenda (SRIA), the European Parliament Recommendation concerning Integrated Coastal Zone Management, and ESA-EC climate cooperation initiatives. Overall, this distribution suggests that while major Black Sea and pan-European sustainability agendas have successfully penetrated stakeholder awareness, more effort may be needed to promote specialized industrial, security, and port strategies.

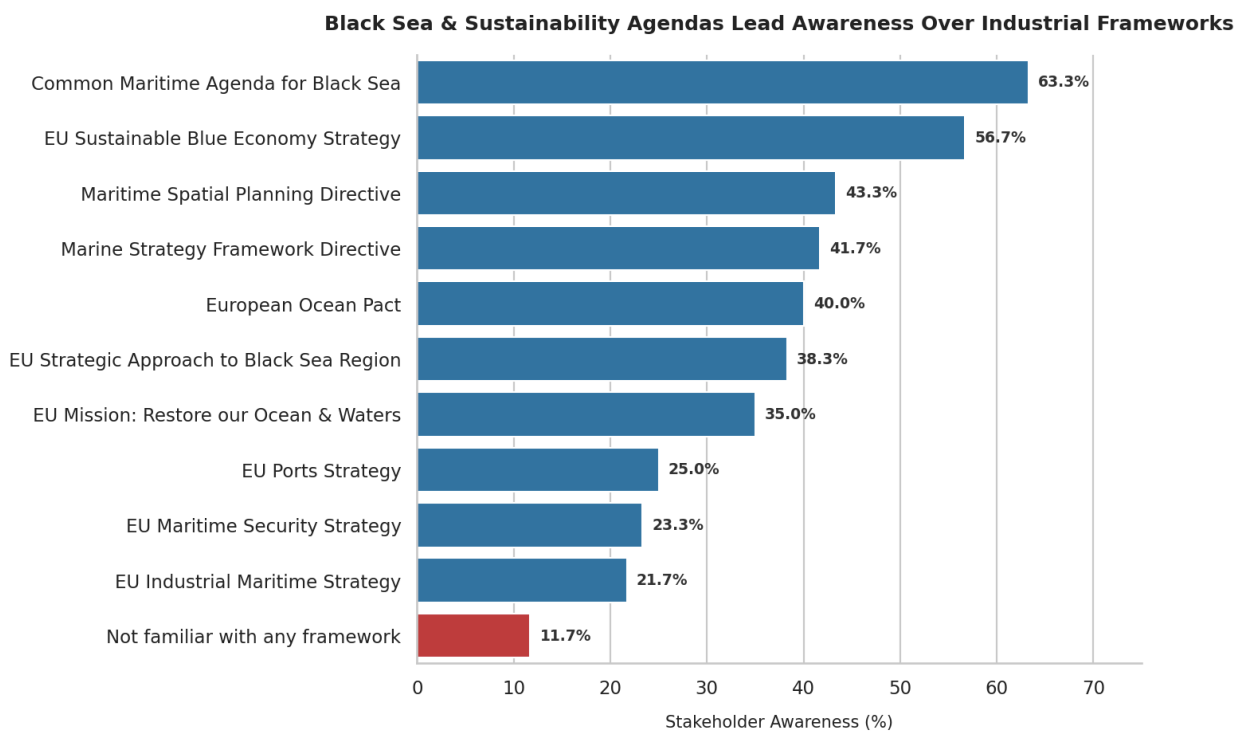


Figure 5 - Stakeholder familiarity with EU strategies and frameworks

Regarding the most significant legal or regulatory gaps hindering blue economy development, a clear consensus emerges across the 58 stakeholder inputs: the primary obstacle is not a complete absence of regulation, but rather severe institutional fragmentation and poor implementation. The most frequently cited barrier is the absence of a unified, cross-sectoral coordination mechanism. Stakeholders report that blue economy governance is dispersed across multiple ministries (e.g., transport, environment, agriculture), leading to overlapping jurisdictions, conflicting sectoral priorities (such as friction between marine protected areas and infrastructure development/offshore energy), and convoluted permitting processes.

Many respondents highlighted that while sectoral laws exist (for traditional shipping or fisheries), there is no dedicated, holistic "Blue Economy Act" or integrated national strategy. Furthermore, existing regulations are often described as outdated and unsuited for emerging sectors like blue biotechnology, offshore renewable energy, and circular economy initiatives, causing bureaucratic delays and deterring investment. Stakeholders frequently pointed to the poor enforcement of existing laws. Even when national frameworks align with EU directives on paper, practical execution suffers due to a lack of specialized administrative capacity, insufficient monitoring, and, in some cases, bureaucratic inertia or corruption.

The responses also indicate a lack of targeted fiscal incentives, complex administrative procedures for accessing funds, and weak translation of scientific research into business development, all of which hinder the competitive scaling of innovative maritime startups. In short, the regulatory ecosystem is characterized by "siloe" governance and heavy administrative burdens that fail to adapt to the dynamic, multi-sectoral nature of a modern blue economy.

Section 3 examines the governance and regulatory landscape shaping the blue economy across the Black Sea region. Transitioning from high-level strategic alignment, the analysis now focuses on the practical operational environment, identifying critical legal bottlenecks, evaluating the effectiveness of inter-institutional coordination, and highlighting the administrative hurdles that local stakeholders and businesses face on the ground.

Building on the regulatory gaps previously identified, the stakeholder assessment of institutional coordination further underscores a pervasive issue of fragmented governance across the region. Out of 60 respondents, a striking majority (**56.7%**) characterize the coordination between different national ministries and agencies as "Poor," pointing directly to overlapping responsibilities and a distinct lack of communication. An additional **40.0%** view the current governance structure as merely "Adequate" or functional, but explicitly note that it remains highly siloe and sectorally divided. Only a marginal **3.3%** of stakeholders believe there is "Excellent" coordination characterized by clear roles and strong institutional synergy (figure 6). This overwhelming consensus confirms that the operational framework governing the blue economy is fundamentally disconnected, acting as a major bottleneck that limits integrated strategic planning and cross-sectoral collaboration.

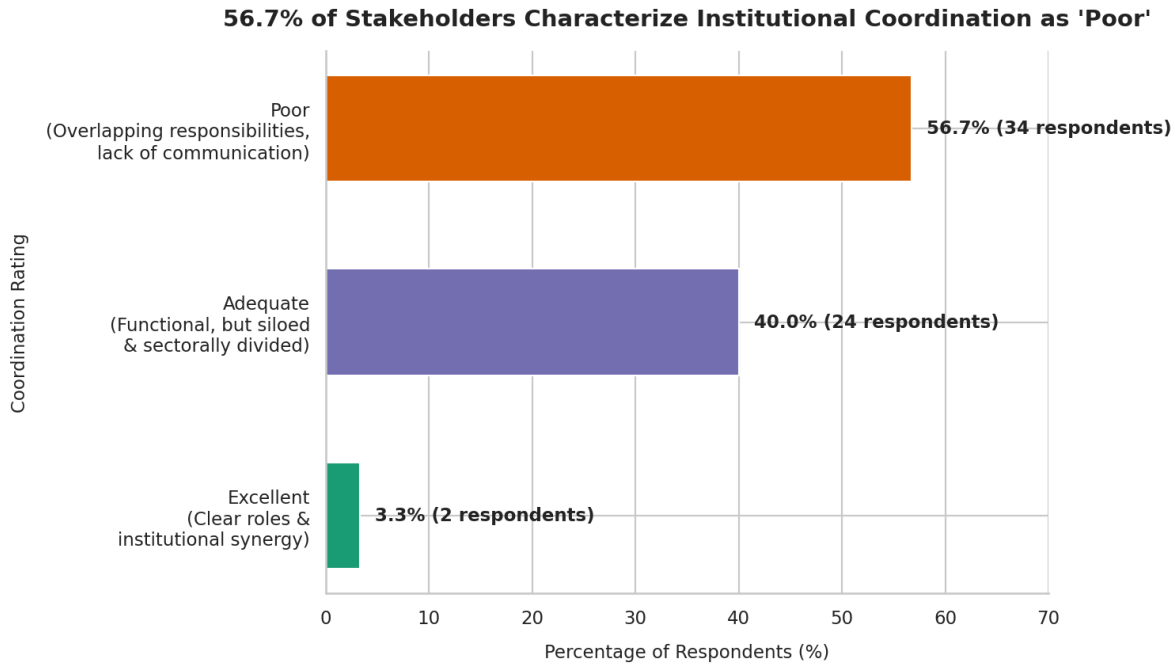


Figure 6 - Stakeholder assessment of institutional coordination

When assessing the primary institutional bottlenecks hindering the local implementation of Blue Economy policies, the data strongly reinforces the structural challenges highlighted in the previous questions. Among the 60 respondents, a commanding majority (**75.0%**) identified a **lack of coordination or communication between agencies** as the leading barrier,

corroborating the qualitative feedback regarding siloed governance. **Funding and financial constraints** were the second most prominent obstacle, cited by **66.7%** of stakeholders, followed closely by **human capacity or technical expertise gaps (61.7%)**, particularly a lack of specialized personnel equipped to handle emerging sectors beyond traditional maritime tourism. Furthermore, **data limitations and a lack of monitoring tools** act as a severe bottleneck for over half of the respondents (**51.7%**), while **legal overlaps and jurisdictional conflicts (30.0%)** continue to stall local initiatives. Open-ended remarks paint a vivid picture of these bottlenecks on the ground, noting that local municipalities often lack dedicated "blue economy" units—instead dispersing responsibilities across traditional departments like property or tourism—and highlighting that conflicting inter-agency interests and high turnover among administrative staff lead to inconsistent signals and hindered policy execution.

When evaluating the strength of transnational cooperation at the Black Sea level, stakeholders report a moderately positive but highly project-dependent environment, reflected in an average rating of 3.21 out of 5. Among the 58 respondents, the largest segment (**34.5%**) rated their cross-border cooperation as moderate (a score of 3), while a combined **38%** rated it highly (4 or 5), and **27.5%** reported weak or non-existent collaboration (1 or 2). Based on the follow-up qualitative feedback, successful transnational collaborations are overwhelmingly driven by participation in EU-funded programs—most notably the **Interreg NEXT Black Sea Basin** and **Horizon Europe** (e.g., cross-border initiatives like the *AlgaeRevive* project)—as well as through regional frameworks such as the **Common Maritime Agenda (CMA) Steering Group** and collaborative networks like the Marine Cluster Bulgaria. However, respondents explicitly identified several severe barriers hindering deeper integration. The primary obstacle is the temporary, project-based nature of current partnerships; once funding cycles conclude, there is a distinct lack of long-term institutional or financial mechanisms to sustain joint work or operationalize project results. Additionally, stakeholders emphasized that complex administrative procedures, misaligned national regulatory frameworks, difficulties in absorbing targeted European funds, and ongoing geopolitical tensions in the wider region heavily restrict the effectiveness of key cooperative bodies, such as the Black Sea Commission.

Following the assessment of transnational cooperation, stakeholders evaluated the primary financial instruments actively driving blue economy initiatives in their respective sectors and countries (Section 4). The data reveals that EU funding acts as the unequivocal lifeblood of the blue economy in the Black Sea region, heavily overshadowing national resources. Out of 60 respondents, a commanding **70.0%** point to **Horizon Europe** (including the *Mission Restore our Ocean and Waters* and the *Sustainable Blue Economy Partnership*) as their primary funding vehicle. This is closely followed by the **European Maritime, Fisheries and Aquaculture Fund (EMFAF)** at **63.3%**, and the cross-border **Interreg NEXT Black Sea Programme** at **56.7%** (figure 7).

In stark contrast, **national or local grants** represent a significantly smaller portion of the funding landscape, relied upon by only **35.0%** of the stakeholders. Environmental and educational funds like the **LIFE Programme (28.3%)** and **ERASMUS+ (28.3%)** provide supplemental support, while dedicated private-facing **EU Investment Instruments** (such as InvestEU or the BlueInvest platform) are utilized by only **20.0%**, directly reflecting the previously noted challenges in attracting large-scale private capital or venture investments to the region.

Through the open-ended "Other" responses, stakeholders highlighted several highly specialized or localized funding streams that fill specific infrastructural and developmental gaps. Most notably, respondents pointed to the **Connecting Europe Facility (CEF)** as a critical tool for

large-scale maritime and port infrastructure modernization. Additionally, targeted regional tools like the **European Regional Development Fund (ERDF)** and **European Social Fund Plus (ESF+)**—mobilized via localized Integrated Territorial Investment (ITI) mechanisms—as well as support from the **UNDP** and the **European Space Agency (ESA)**, were identified as vital supplements to the standard maritime funding ecosystem.

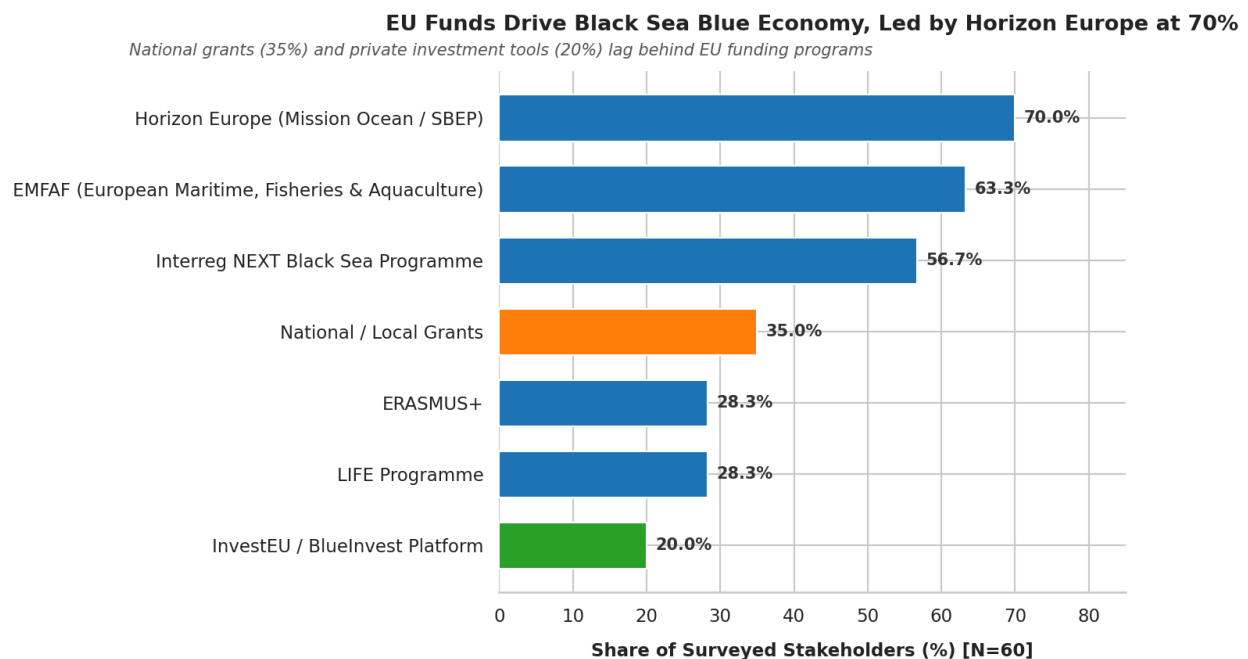


Figure 7 - Primary financial instruments

Despite the availability of critical EU and regional funding instruments, stakeholders report significant challenges in actually accessing these resources. Out of 56 respondents, the average accessibility rating sits at a moderate **2.93 out of 5**, with the vast majority (**71.4%**) scoring accessibility as a 3 or lower (including **28.6%** who find it "very difficult" or "difficult" to access). The qualitative feedback from the follow-up question clearly identifies the primary culprits behind this bottleneck. The most universally cited barrier is **complex bureaucracy** and the heavy administrative burden associated with application and reporting procedures. Stakeholders note that the documentation requirements, strict regulatory oversight, and demand for high project maturity create steep barriers to entry, especially for small municipalities and startups.

The second major hurdle is a **lack of co-financing capability**; many local entities and technical agencies simply do not have the upfront capital required to unlock matching European funds. Additionally, respondents frequently highlighted **insufficient awareness** of available opportunities, a severe lack of specialized administrative capacity or expert consultants to prepare competitive project proposals, and an increasingly high level of competition across the EU. Consequently, while the financial resources exist, the structural friction of "over-regulation" and the lack of tailored, accessible financial instruments for early-stage or smaller-scale projects prevent localized stakeholders from fully leveraging them.

When asked to identify the specific sectors suffering from the greatest lack of adequate funding or investment, the open-ended responses reveal a sharp divide between the capital-intensive needs of traditional infrastructure and the high-risk financial barriers of emerging maritime

innovations. A prominent theme across the feedback is the severe funding deficit in **marine biotechnology and maritime innovation**. Stakeholders frequently note that these sectors—which include extracting bioproducts, deploying new digital/monitoring systems, and utilizing AI/Earth Observation technologies—suffer from high upfront costs and long-term return horizons, making them unappealing to private investors and difficult to commercialize without specialized financial instruments.

Equally critical is the perceived funding gap in the **energy transition and decarbonization** of established sectors. Respondents point specifically to a lack of investment in offshore renewable energy (wind, wave, and tidal) as well as the greening of maritime transport and port infrastructure, which urgently requires capital for alternative fuels, shore-side electricity (OPS), and the modernization of technical fleets. Furthermore, foundational environmental and social pillars of the blue economy, such as **marine ecosystem protection, ocean data monitoring, and sustainable fisheries/aquaculture** (including critical support infrastructure like modern landing points and eco-tourism alternatives for local communities), are frequently cited as severely underfunded. Ultimately, whether referring to advanced biotechnology, green port upgrades, or basic ecosystem monitoring, stakeholders underscore that long-term, risk-tolerant investment mechanisms are largely missing from the region.

Section 5 shifts the focus toward the private sector and market dynamics, examining the day-to-day challenges faced by businesses, startups, and investors operating within the Black Sea region's blue economy. By evaluating the primary barriers hindering commercial growth—from infrastructural deficits and workforce shortages to regulatory friction—this analysis identifies the critical friction points where public policy must intervene to catalyze sustainable, private-sector-led growth.

From a business and investment perspective, stakeholders rated various barriers hindering the growth of the regional blue economy on a scale up to 5. The data reveals that the most significant obstacles are systemic and regulatory rather than strictly financial. **Environmental and climate-related risks** (averaging 3.34) and a **lack of long-term policy predictability** (3.32) rank as the most severe barriers, underscoring that business confidence is heavily undermined by an uncertain regulatory and ecological future. This is closely followed by **complex administrative or regulatory procedures** (3.28), which act as a direct structural bottleneck for private enterprises. Surprisingly, while still significant, **insufficient financial resources** (3.11), **shortage of qualified workforce** (3.10), and **insufficient infrastructure** (3.08) rank slightly lower, indicating that capital and capacity issues, though prevalent, are exacerbated by poor governance and climate instability.

Qualitative feedback on the most affected sectors highlights a sharp divide: while traditional sectors like coastal tourism can function despite these systemic issues, emerging and high-tech industries—such as **marine biotechnology, offshore wind energy, innovative aquaculture, and blue carbon initiatives**—are disproportionately impacted, remaining in a state of "investment stagnation." Stakeholders specifically note that these high-risk innovation sectors suffer most from fragmented governance, lagging digitalization, and a severe lack of research commercialization mechanisms bridging the scientific community and private businesses.

Stakeholder assessments of the region's current "blue skills" reveal a workforce firmly rooted in traditional maritime capabilities, yet significantly underprepared for the modern green and digital transition. On a scale of 1 to 5, traditional **maritime and engineering skills** (3.42) and **research and innovation capacity** (3.30) scored the highest, reflecting a solid historical

baseline in conventional maritime education. However, critical gaps emerge in the competencies required for the future blue economy: **digital and technological skills (3.13)**, **entrepreneurial and business development skills (3.08)**, and **vocational education and training (3.03)** all show marginal availability. Notably, **green and sustainability-related skills** scored the lowest at **2.97**, underscoring a severe shortage in expertise for decarbonization, ecosystem restoration, and sustainable marine management. In the qualitative follow-up, respondents overwhelmingly emphasized that theoretical academic knowledge is failing to translate into market-ready solutions. To overcome these deficits, stakeholders strongly advocate for a shift from fragmented academic education to integrated lifelong learning ecosystems. Recommended measures include modernizing university curricula, establishing joint business-academia innovation centers, and introducing targeted reskilling, vocational training, and certification schemes specifically designed for emerging sectors like offshore engineering, marine biotechnology, and "Smart Blue" digitalization.

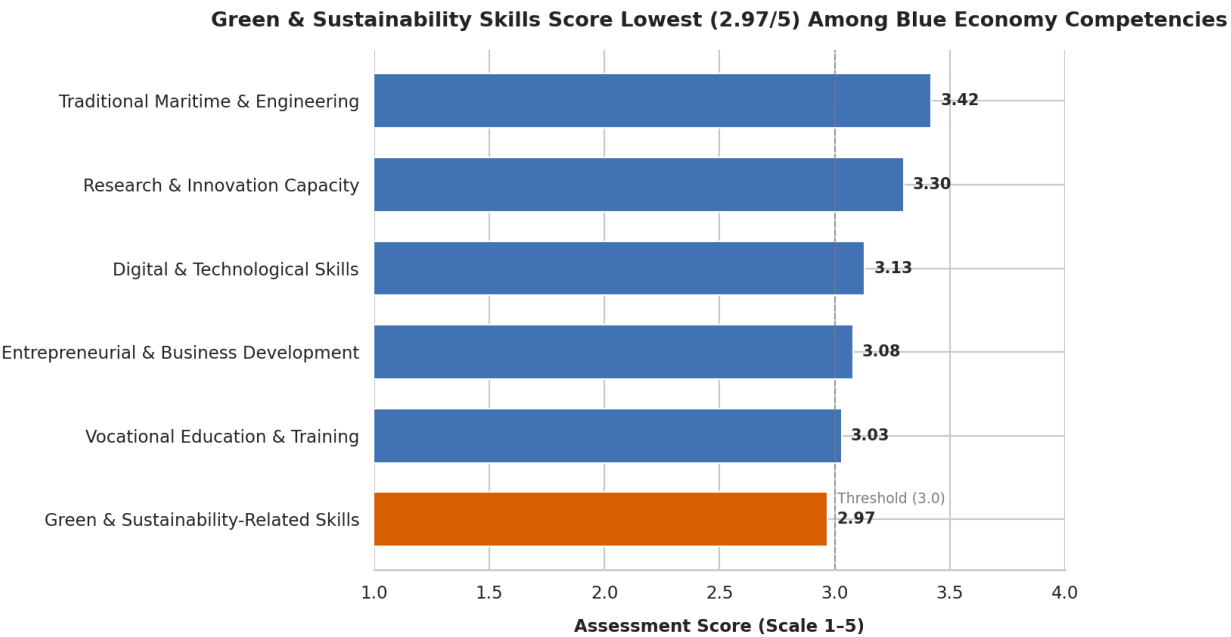


Figure 8 - Stakeholder assessments of the region's current "blue skills"

After identifying the structural bottlenecks, investment gaps, and skill deficits currently hindering the Black Sea's blue economy, section 6 pivots to the future, exploring the most promising avenues for growth. By assessing where stakeholders see the greatest untapped potential, we can identify the specific sectors, innovations, and sustainable models that represent the most viable strategic opportunities for transforming the region's maritime ecosystem.

The assessment of untapped potential reveals a clear consensus among stakeholders: the future of the Black Sea's blue economy lies equally in modernizing foundational sectors and pioneering high-tech, eco-centric innovations. Among the respondents, the highest perceived opportunities are remarkably balanced, with the **circular blue economy**, **blue biotechnology**, and **sustainable coastal tourism** each identified by **45.0%** of stakeholders. This is closely followed by the development of **marine renewable energy (43.3%)** and the modernization of **fisheries and aquaculture (41.7%)**. Foundational enablers such as **maritime digitalization** and **blue skills/workforce development** were also highly prioritized, each capturing **40.0%** of the responses, while **marine ecosystem restoration** followed at **38.3%**. Open-ended feedback vividly illustrates this landscape; stakeholders specifically point to offshore wind energy and

algae-based biotechnology as massive, almost entirely unexploited pillars capable of attracting significant international capital and driving deep technological transformation. Furthermore, niche opportunities such as restorative aquaculture, ecological biomass utilization, yachting and sailing sports, and non-structural coastal protection (e.g., advanced zoning and spatial planning) highlight a broad regional mandate to pivot away from traditional extractive models toward an innovative, climate-resilient maritime economy.

When asked to recommend a single major policy change or strategic action to improve their national blue economy ecosystem, the stakeholder responses converged overwhelmingly on the need for integrated, centralized governance. The most frequent and forceful recommendation is the creation of a **Unified National Blue Economy Strategy** supported by a dedicated, cross-ministerial coordination mechanism (e.g., a "National Council" or "Task Force" for the Blue Economy). Stakeholders argue that elevating the blue economy to a distinct national priority would eliminate the current institutional fragmentation, align conflicting sectoral policies (such as transport, energy, and environment), and streamline complex licensing regimes.

Beyond governance restructuring, respondents heavily emphasized the need for **specialized, multi-annual financial instruments** tailored specifically to the blue economy. This includes uncoupling critical infrastructure maintenance (like riverbank dredging) from annual bureaucratic fiscal cycles and creating simplified funding access for startups and marine biotechnology. A third major theme centers on **adaptive, bottom-up regulation and law enforcement**; stakeholders stress that central administrations must act as facilitators by validating local, grassroots solutions (especially in isolated coastal communities) and strictly enforcing existing environmental laws rather than simply drafting new theoretical policies. Finally, targeted investments in **blue skills development** and the **commercialization of scientific research** were frequently cited as mandatory steps to transition the region from traditional maritime activities toward a high-tech, sustainable blue economy.

When identifying the most significant challenges (Q22) hindering the development of the blue economy at the subnational (regional or local) level, stakeholders paint a picture of localized systemic friction heavily tied to funding and governance. Out of 60 respondents, a substantial majority (**65.0%**) cite a **lack of financial resources** as the primary barrier preventing local development. However, these financial constraints are deeply intertwined with structural governance issues, as the second most pressing challenge is a **lack of coordination between levels of government (53.3%)**. This disconnect is further compounded by the absence of a **clear and holistic blue economy strategy (40.0%)** and the **unclear allocation of roles and responsibilities (33.3%)** between national and regional authorities. Operational and market hurdles such as **regulatory barriers (31.7%)** and **financial risks for businesses (30.0%)** also remain prominent bottlenecks for local actors. Conversely, issues like cultural barriers (11.7%) or a lack of engagement from the private sector and civil society (13.3%) are viewed as the least significant obstacles. Overall, the data indicates that local municipalities and regional stakeholders are primarily constrained by a top-down lack of synchronized strategic planning and the resulting scarcity of accessible, decentralized funding.

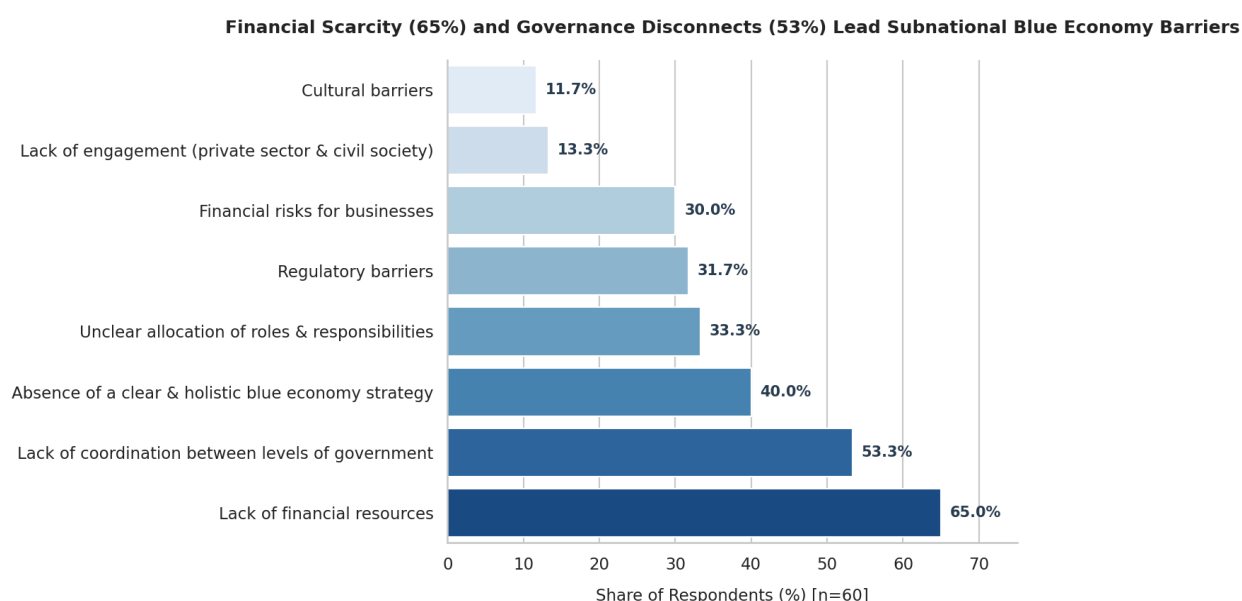


Figure 9 - The most significant challenges

In terms of the top priority actions to accelerate local blue economy development, stakeholder responses directly mirrored the structural bottlenecks identified in previous questions. Out of 60 respondents, the clear leading priority is the need to **channel public and private funds (55.0%)** toward regional initiatives, reinforcing the acute demand for accessible, decentralized financing. The next highest priorities emphasize governance and partnerships: **fostering collaboration (43.3%)** across various sectors and institutions, and **setting up a formal blue economy initiative or strategy (41.7%)** at the local level to provide a unified development framework. To modernize the local operating environment, stakeholders also highly prioritized **boosting technology use and uptake (36.7%)**, **improving the regulatory environment (35.0%)**, and **fostering a science-policy dialogue (35.0%)**. Interestingly, direct environmental or social actions—such as tackling water pollution (18.3%), fostering decarbonization (15.0%), or preserving local culture (13.3%)—were ranked lower. This suggests that stakeholders view financial reform, strategic planning, and regulatory streamlining as the critical, prerequisite steps needed *before* broad environmental and social goals can be effectively achieved at the grassroots level.

To conclude the survey, respondents were given the opportunity to highlight specific local challenges, geographic nuances, or emerging issues that standard strategic frameworks might overlook. This final section captures the unique, on-the-ground realities—ranging from geopolitical security to distinct hydrological phenomena—that must be integrated into a comprehensive "State of the Art" report on the Black Sea's blue economy.

When addressing additional local nuances, the 27 qualitative responses heavily underscore the inescapable impact of **geopolitics and regional security**. Stakeholders in the western Black Sea highlight a "security-safety-development trilemma," noting that physical hazards like drifting mines and restricted zones are directly bottlenecking new blue economy projects and drastically inflating shipping insurance premiums. Consequently, respondents emphasize the critical role of the **Danube riverine dimension**; the maritime Danube is increasingly relied upon as an alternative logistics corridor (EU Solidarity Lanes). However, this inland waterway faces severe **climate adaptation realities**, with extended summer droughts now becoming a permanent

seasonal norm that drastically reduces navigable depths and causes massive financial losses for shipping companies.

Beyond transport and security, respondents point to the unique ecological fragility of the Black Sea itself—specifically its low salinity, lack of tides, and toxic hydrogen sulfide layer—which demands highly specialized environmental management. Despite this fragility, stakeholders lament that **Integrated Coastal Zone Management (ICZM)** has largely vanished from policy discussions. Finally, at the socio-economic level, there is a distinct barrier created by a general lack of "blue awareness" among local communities, leading to fragmented, small-scale economic activities. While some isolated positive initiatives exist—such as the DOKA Blue Economy Result-Oriented Programme in Türkiye—local actors remain frustrated by persistent data gaps (e.g., EU Blue Economy Observatory indicators lagging behind) and a systemic failure to translate scientific research into commercial, grassroots applications.

Based on the comprehensive feedback from stakeholders across Bulgaria, Romania, Türkiye, and Georgia, the blue economy in the Black Sea region is currently in a critical transitional phase. While the region boasts a strong foundation in traditional maritime activities—such as maritime transport, shipping, and coastal tourism, and demonstrates a high commitment to environmental stewardship, the evolution toward a truly integrated, innovative, and sustainable blue economy is hindered by systemic structural bottlenecks.

The survey data highlights several overarching themes that define the current "State of the Art" and dictate the necessary steps for future growth:

- **Fragmented Governance and Regulatory Friction:** The most profound barrier identified across the entire region is the siloed nature of maritime governance. While foundational laws and EU-aligned environmental directives exist, the lack of dedicated, cross-sectoral "Blue Economy" strategies creates overlapping jurisdictions, complex bureaucratic hurdles, and conflicting priorities between environmental conservation and industrial development. Institutional coordination is overwhelmingly viewed as poor, acting as a severe bottleneck at both national and subnational levels.
- **A Project-Dependent Financial Ecosystem:** The region's blue economy is heavily reliant on EU funding instruments (e.g., Horizon Europe, EMFAF, and Interreg). However, stakeholders report that these funds are difficult to access due to high administrative burdens, complex application procedures, and steep co-financing requirements. More critically, transnational cooperation and innovation are currently sustained almost entirely by temporary project cycles, lacking the long-term, multi-annual financial mechanisms required to commercialize scientific research or scale high-risk emerging sectors like marine biotechnology and offshore renewable energy.
- **The "Blue Skills" Deficit:** While traditional maritime and engineering competencies remain strong, there is a pronounced shortage of the specialized skills required for the future economy. Stakeholders point to critical gaps in digital literacy, green sustainability training, and entrepreneurial capacity, calling for a shift from theoretical academic curricula to integrated, business-aligned lifelong learning and vocational training ecosystems.
- **Untapped Potential and Strategic Opportunities:** Despite these challenges, the region holds massive untapped potential. Stakeholders see the greatest opportunities in the circular blue economy, marine biotechnology, sustainable coastal tourism, and the greening of traditional sectors (e.g., port decarbonization and alternative marine fuels). Furthermore, adapting to local nuances—such as the geopolitical security realities of the Black Sea, the climate-induced droughts affecting the maritime Danube, and the unique

hydrography of the basin—presents an opportunity to pioneer specialized, resilient maritime models.

To unlock the full potential of the Black Sea's blue economy, incremental sectoral adjustments will not suffice. The resounding consensus from regional stakeholders is a demand for **unified, centralized governance**. The primary recommendation is for each nation to establish an integrated Blue Economy Strategy managed by a dedicated, cross-ministerial task force. By decoupling critical infrastructure funding from short-term bureaucratic cycles, simplifying access to capital for local startups, and transforming the regulatory environment from a restrictive barrier into an adaptive facilitator, the Black Sea region can successfully transition from a traditional maritime basin into a resilient, high-tech hub of sustainable blue growth.

Potentials and Gaps (SWOT Analysis)

The following SWOT analysis consolidates the findings from Romania, Bulgaria, Georgia, and Türkiye to provide a unified cross-sectoral assessment of the Black Sea's blue economy. It evaluates internal capacities—such as established industrial foundations, academic expertise, and legal frameworks—against external drivers, including geopolitical shifts, EU funding mandates, and climate change.

The primary strategic takeaway across the region is that the Black Sea basin is not starting from scratch; it possesses robust traditional maritime sectors. The central challenge, therefore, is not to create a blue economy from zero, but to integrate existing assets under a sustainable, coordinated framework that increases value-added output, mitigates environmental pressures, and commercializes scientific innovation.

Tabel 18: Shared strengths, weaknesses, opportunities, and threats characterizing the blue economy ecosystem across the four analyzed countries.

STRENGTHS (Internal)	WEAKNESSES (Internal)
Established industrial foundation: Strong baseline in traditional sectors, including maritime transport, competitive shipbuilding (e.g., Vard Tulcea), ports (Constanța, Batumi, Poti), coastal tourism, and fisheries.	Institutional fragmentation: Severe "silo effect" across ministries resulting in a lack of unified national blue economy strategies or cross-sectoral coordination bodies.
Scientific & Academic Expertise: Robust network of marine research institutes, oceanographic centers, and maritime universities capable of supporting the blue transition.	Bureaucracy & capacity gaps: Complex permitting processes and insufficient project-preparation and administrative capacity, particularly at local levels.
Strategic Connectivity: Vital geographic position supporting regional logistics, the Middle Corridor, and Danube-Black Sea transit routes.	Skills & demographic deficits: An aging workforce paired with a critical shortage of modern "blue skills," particularly in digital, green transition, and entrepreneurial competencies.
Foundational Legal Frameworks: Existing sectoral laws covering transport, spatial	Weak commercialization: A persistent gap between scientific research and

planning, environment, and initial steps toward offshore wind regulation.	market-ready business applications, limiting high-value processing and innovation.
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OPPORTUNITIES (External)	THREATS (External)
Emerging High-Tech Sectors: Massive growth potential in offshore renewable energy (e.g., wind energy), marine biotechnology, digital ocean twins, and circular blue economy models.	Geopolitical instability: Regional conflict, drifting sea mines, and security threats that increase insurance costs and undermine investment confidence in maritime logistics.
EU Funding & Green Deal Alignment: Access to extensive "Blue Finance" mechanisms (Horizon Europe, EMFAF, Interreg NEXT, PNRR) and alignment with the Common Maritime Agenda (CMA).	Climate Change & Environmental Degradation: Accelerating coastal erosion, pollution, invasive species, and drought-driven navigability issues on vital waterways like the Danube.
Eco-Tourism Diversification: Transitioning from highly concentrated, seasonal mass tourism to sustainable, year-round heritage, wellness, and eco-tourism models.	Regulatory Lag & Poor Enforcement: The risk that legislative frameworks fail to keep pace with rapid technological changes, compounded by weak enforcement of existing environmental laws.
Sustainable Mariculture & Ecosystem Restoration: Expanding restorative aquaculture, coastal wetland restoration, and blue carbon sequestration initiatives.	Over-Reliance on Donor Funding: The risk that emerging sectors remain marginal and unsustainable without continuous, project-based international donor financing.

When analyzing the intersecting themes from Romania, Bulgaria, Georgia, and Türkiye, four critical strategic implications emerge that will dictate the future trajectory of the Black Sea blue economy.

From institutional fragmentation to integrated governance

The single most consistent finding across all four nations is the absence of dedicated, cross-sectoral blue economy coordination. Currently, the blue economy is governed through separated institutional channels (e.g., transport, environment, energy, tourism). To fully realize the potential of Maritime Spatial Planning and regional initiatives, the blue economy must be treated as an *integrating policy layer* rather than a standalone sector. Addressing this "silo effect" through unified national strategies is the most direct lever available to accelerate project permitting and outpace regional market competition.

Transitioning from compliance to commercialization

While the region has successfully developed scientific research capabilities and navigated the transposition of environmental directives, it struggles with market application. There is a pronounced gap between academic research and bankable, market-ready business solutions. The next evolutionary phase requires moving away from a purely "grant-based"

ecosystem—where projects only survive via public or donor funding—toward a "bankable" economy that actively attracts private equity, institutional investors, and venture capital. This requires dedicated innovation funding mechanisms combined with investment readiness support for SMEs.

Modernizing established sectors vs. fostering emerging domains

The region benefits from a heavy concentration of economic activity in traditional maritime transport, ports, and coastal tourism. The immediate opportunity lies not in abandoning these sectors, but in driving their technological modernization through digitalization, green port infrastructure, and value-added processing (e.g., in fisheries and aquaculture). Simultaneously, the region must leverage its existing industrial core—such as Romania's competitive shipbuilding sector—to supply emerging, high-potential markets like offshore renewable energy construction and marine biotechnology.

Environmental protection as an economic prerequisite

Across the Black Sea, environmental sustainability can no longer be viewed solely as a regulatory obligation; it is a strict economic condition for growth. Climate risks, coastal erosion, marine litter, and biodiversity loss (e.g., the proliferation of invasive species) directly threatens the financial viability of coastal tourism, fisheries, and port infrastructure. Consequently, replacing unsustainable coastal construction and "hard" engineering with nature-based solutions (such as seaweed forest restoration) and embedding ecosystem health into every sectoral project are mandatory steps for ensuring long-term competitiveness.

Conclusions and recommendations

The comprehensive diagnostic of the blue economy across Romania, Bulgaria, Georgia, and Türkiye reveals a Black Sea region at a critical juncture. While the basin boasts fundamental maritime assets, dynamic traditional sectors, and significant legislative progress, the transition toward a truly integrated, innovative, and sustainable blue economy is consistently hindered by systemic administrative inertia and structural fragmentation. This final chapter synthesizes the primary conclusions from the institutional, legal, sectoral, and financial analyses of the four partner countries and translates them into actionable strategic recommendations.

Conclusions

Across the analyzed nations, the blue economy is characterized by a mix of high potential and systemic bottlenecks. The findings converge on several key cross-cutting themes:

- **Governance fragmentation and the "Silo Effect":** A universal challenge across the region is the lack of unified national blue economy frameworks. In Romania, Bulgaria, and Türkiye, despite possessing relevant sectoral legislation (such as Maritime Spatial Plans and environmental strategies), governance remains highly fragmented across multiple line ministries. In Georgia, the blue economy agenda is emerging organically from existing sectors without a dedicated national policy. This fragmentation creates severe administrative bottlenecks, overlapping jurisdictions, and a disconnect between national strategies and local, "bottom-up" execution.
- **Strong formal alignment vs. uneven practical implementation:** While national legal frameworks are broadly aligned with EU policy objectives (e.g., the European Green

Deal) and the Common Maritime Agenda for the Black Sea (CMA), practical implementation lags. Regulatory frameworks are often mature at the national level but suffer from weak implementation capacity and low stakeholder engagement at the regional and municipal levels.

- **The transition from extractive to innovative sectors:** The Black Sea blue economy rests on a strong foundation of traditional sectors—maritime transport, ports, coastal tourism, and fisheries/aquaculture. While these sectors remain the primary economic drivers, the transition toward high-value, emerging domains (such as offshore wind energy, marine biotechnology, and smart port logistics) lacks cohesive deployment strategies. Furthermore, sectors like aquaculture and tourism require urgent modernization to achieve value-added processing, certification, and year-round sustainability.
- **A project-dependent, grant-reliant financial ecosystem:** Across the region, EU and international funding mechanisms (e.g., EMFAF, Horizon Europe, Interreg NEXT, PNRR, LIFE) serve as the lifeblood of maritime innovation. However, this heavy reliance on non-reimbursable donor grants masks a critical absence of private, bankable "blue finance." Complex bureaucratic procedures and insufficient project-preparation capacity—especially among SMEs, municipalities, and research institutions—prevent actors from accessing funds. Furthermore, the region struggles to attract venture capital and private equity due to perceived investment risks.
- **Environmental and geopolitical "permanent norms":** The geopolitical instability in the Black Sea (including maritime security threats and drifting mines) and the accelerating impacts of climate change (such as coastal erosion, ecosystem degradation, and riverine droughts affecting the Danube) can no longer be treated as anomalies. These are permanent structural realities that require proactive, systemic resilience planning rather than reactive crisis management.
- **Project-based regional cooperation:** While institutional participation in Black Sea regional frameworks (CMA, BSEC, Bucharest Convention) is mature, on-the-ground transnational cooperation remains operationally limited to individual, short-term, donor-funded projects, lacking permanent mechanisms for cross-border integration.

Recommendations

To translate these findings into actionable growth and to operationalize the Common Maritime Agenda (CMA), the following strategic recommendations are proposed for national authorities, regional bodies, and the private sector.

Policy improvements and institutional strengthening

- **Develop unified national blue economy roadmaps:** Nations must elevate the blue economy from implicit sectoral policies to a visible, national coordination agenda. Countries should formulate dedicated Blue Economy Strategies (or formal initiatives) that harmonize the objectives of transport, environment, energy, tourism, and economy ministries.
- **Establish permanent inter-ministerial coordination:** To overcome the "silo effect," countries must create permanent, high-level Blue Economy Task Forces or National

Councils. These bodies (potentially reporting to the Prime Minister's office or broadening existing MSP councils) will resolve inter-departmental conflicts and streamline permitting processes.

- **Implement "Blue Innovation" fast-tracks:** Create regulatory sandboxes to accelerate the permitting of emerging sectors like marine biotechnology and offshore renewable energy, ensuring legislative speed matches technological advancement while maintaining strict environmental criteria.
- **Empower regional authorities and foster clusters:** Decentralize execution by empowering coastal municipalities to develop localized strategies, drawing inspiration from the Burgas Municipality's dedicated Blue Economy directorate. Furthermore, foster regional high-value hubs, such as a specialized Aquaculture Cluster in Türkiye's TR90 region (Eastern Black Sea), to drive certification, cold-chain logistics, and market access.
- **Institutionalize science-policy-business linkages:** Bridge the gap between academic research and commercial application by establishing formal dialogues and joint innovation centers. This will ensure that regional capabilities in oceanography, biotechnology, and digitalization are translated into market-ready business solutions.
- **Address blue skills deficits:** Develop specialized Blue Skills Hubs in collaboration with maritime academies and vocational schools. Curricula must urgently pivot to address gaps in digital data management, green transition competencies, alternative marine fuels, and blue entrepreneurship.

Funding optimization and investment readiness

- **Shift to blended finance models:** Transition the funding architecture from strict grant dependency to blended finance models that leverage instruments like InvestEU guarantees and private equity. This will de-risk projects for commercial banks and attract venture capital for large-scale infrastructure and innovation.
- **Establish blue economy project preparation desks:** To overcome the capacity bottleneck, create dedicated regional advisory desks to help municipalities, SMEs, and cooperatives transform ideas into bankable projects. These desks should assist with concept notes, feasibility studies, environmental safeguards, and complex EU funding applications.
- **Implement multi-annual funding for critical resilience:** For essential operations like maintenance dredging (e.g., on the Danube) and coastal erosion protection, governments must secure multi-annual funding cycles. This protects critical climate-adaptation and logistics infrastructure from the volatility of annual national budget cycles.

Enhancing Black Sea level cooperation

- **Leverage the CMA as a strategic reference:** All cross-border proposals (Interreg, Horizon Europe) should explicitly map their objectives to CMA goals. National priorities must actively reflect the CMA's pillars of healthy ecosystems, competitive sectors, and regional connectivity.

- **Activate industry-facing national hubs:** Utilize the Black Sea Assistance Mechanism (BSAM) to create highly active, industry-facing National Hubs (e.g., in Constanța or Trabzon). These hubs should serve as primary clearinghouses for cross-border project matchmaking and investment promotion.
- **Standardize data and joint monitoring:** Integrate national marine, environmental, and spatial data with the European Digital Twin of the Ocean. Joint Black Sea monitoring protocols (covering marine litter, biodiversity, and water quality) will improve regional crisis management, maritime security, and environmental impact assessments.
- **Develop cross-border blue tourism routes:** Capitalize on the region's shared heritage by creating transnational tourism routes that connect coastal cities. By linking maritime heritage, gastronomy, sailing, and eco-tourism, the region can transition from localized, seasonal mass tourism to a sustainable, year-round Black Sea destination brand.
- **Develop Black Sea connectivity through joint initiatives** (multimodal transport, innovative modes of eco-transportation, etc.) to capitalize on the geostrategic position of the Black Sea at the Middle Corridor (Trans-Caspian International Transport Route — TITR), which links Central and East Asia with European markets

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