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WORLD ECONOMIC FORUM

The Ocean Economy Imperative: Defining Value, Managing Risk and Mobilizing Investment

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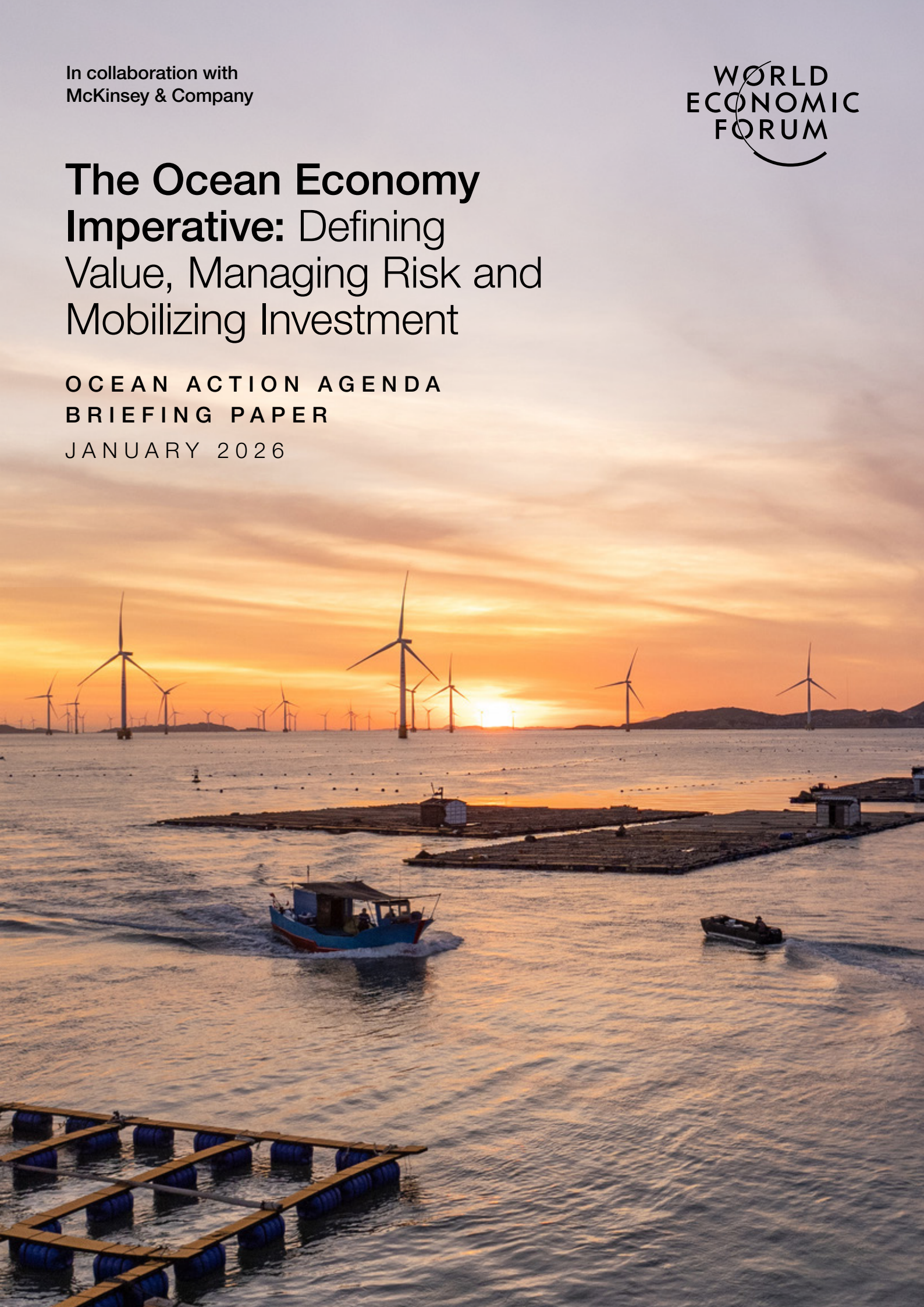

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Contents

Foreword

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As the global economy adjusts to slower growth, tighter constraints and rapid change, attention is increasingly turning to the next sources of durable, risk-adjusted value. The ocean economy stands out as underexplored yet increasingly strategic – supporting global trade, food production, energy systems, tourism and digital infrastructure, while opening new pathways for innovation and value creation. As businesses and investors confront their growing exposure through supply chains, infrastructure, logistics and coastal assets, demand is rising for partners, capital and long-term investment across both established and emerging ocean sectors.

This matters now because the conditions that once obscured the ocean economy's relevance are shifting. Resource efficiency, resilience and adaptability are becoming core drivers of competitiveness, and ocean-based sectors sit at their intersection while also operating without many of the constraints of land-based systems. Recognizing existing exposure to the ocean economy is a necessary first step in managing risk, protecting value and improving decision-making. Equally important is the opportunity to move early, helping shape industries that are still forming, influencing standards and partnerships, and positioning capital where long-term demand and structural need converge.

This paper aims to shift the conversation from awareness to action – from seeing the ocean primarily as an environmental concern to engaging with it as a foundation of economic resilience and long-term value creation. The ocean economy's future will be shaped by decisions made today: how risks are anticipated, opportunities identified and collaboration used to enable scale. The World Economic Forum looks forward to working with partners to realize the ocean economy's untapped potential for people, markets and the planet.

Introduction

Planetary systems underpin life on Earth and the stability of economies and societies.[1] The ocean sits at the centre of this interdependence, regulating the climate and sustaining global food and trade systems, while absorbing a large share of planetary stress. In 2024, global average temperatures were 1.5°C higher than pre-industrial levels for the first time,[2] triggering planetary tipping points: warm-water coral reefs crossed their thermal tipping point of 1.2°C and experienced the worst bleaching event on record over 2023-2025,[3] and recent studies suggest that ocean acidification has also crossed its "planetary boundary."[4]

These shifts in planetary systems already present economic consequences, such as rising costs across supply chains, infrastructure and insurance markets. Global food demand, for example, is increasing as agricultural systems face mounting challenges, including soil degradation, water scarcity, biodiversity loss and climate-driven yield volatility. Maintaining output under these conditions requires more capital and higher inputs. At the same time, global growth dynamics are slowing, and leaders anticipate a period of weaker growth and structural disruption, particularly with shocks to trade and value changes expected to have system-wide impacts.[5] As a result, investors, business leaders and capital providers are converging around a shared strategic question: Where can durable, risk-adjusted growth be found in a world of tighter constraints?

Against this backdrop, the ocean economy – projected to double from $2.6 trillion in 2020 to $5.1 trillion by 2050[6] – emerges as a compelling investment opportunity. Several structural characteristics underpin this potential.

First, much of the ocean economy operates outside the zero-sum competition for land, even as urbanization, agriculture, energy transition, infrastructure and conservation efforts compete for finite space. Additionally, while marine environments are not immune to climate change, some ocean-based activities, particularly those offshore, exhibit comparatively stable physical conditions over long time horizons, supporting more predictable operational environments for capital-intensive assets.[7]

Second, the ocean offers pathways to resource production with lower input intensity. In food systems, well-managed aquaculture and fisheries can generate high-quality protein with significantly lower land use, freshwater consumption, and, in some cases, greenhouse gas emissions relative to conventional agriculture. For investors, these efficiency advantages translate into potential resilience against input price volatility, regulatory tightening and climate-related disruptions.

Finally, the scale of the ocean economy is underestimated. Aggregate ocean-based economic activity – encompassing food production, transportation, energy, materials, biotechnology, tourism and digital infrastructure – has been estimated to equal the fifth-largest economy if it were a country. This is not merely a story of size, but of growth dynamics. In recent decades, ocean-related industries have expanded at a rate that in many cases outpaces traditional sectors, driven by technological innovation, rising demand for sustainable resources, and increasing recognition of the ocean's central role in global systems.

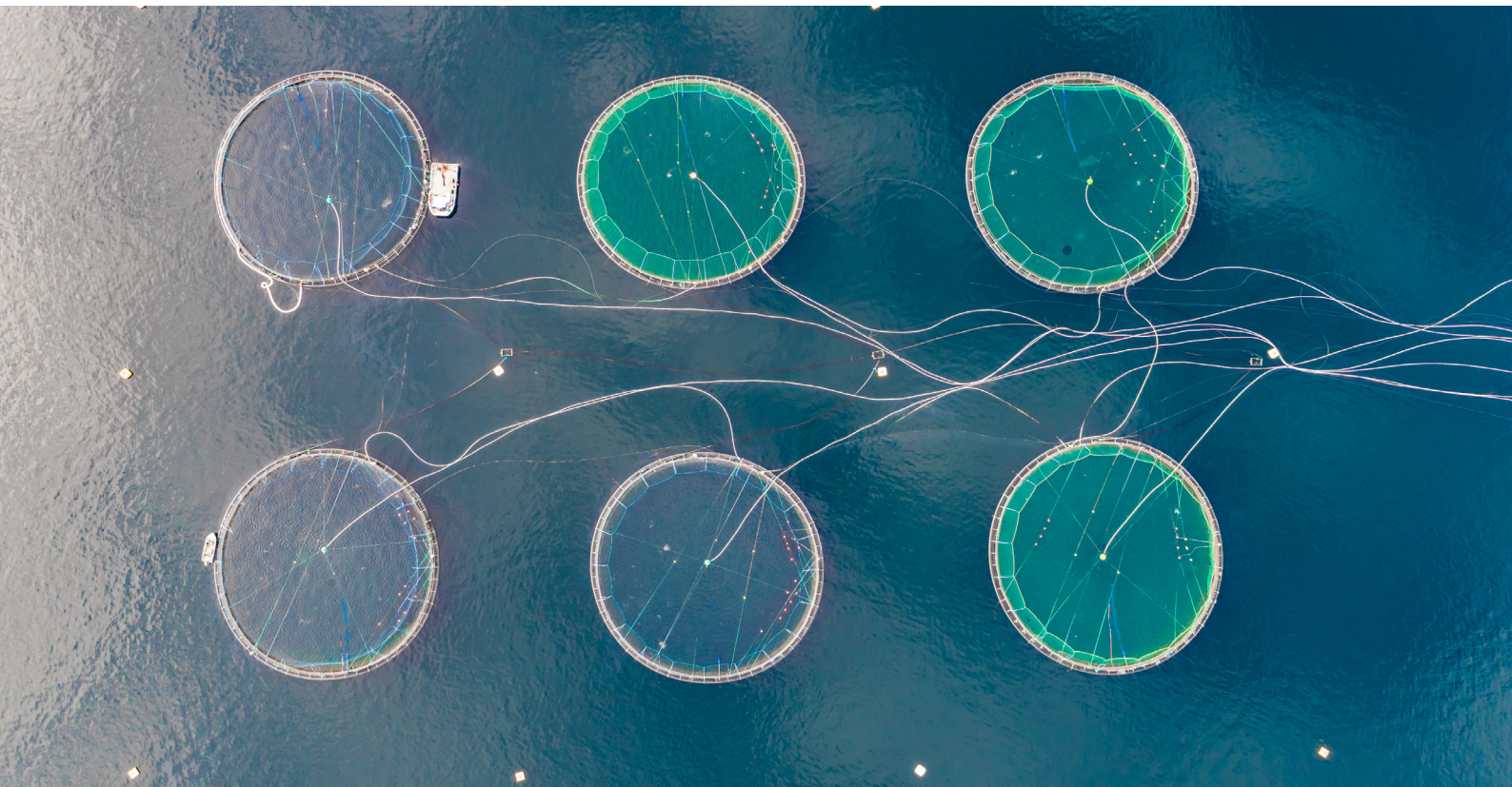
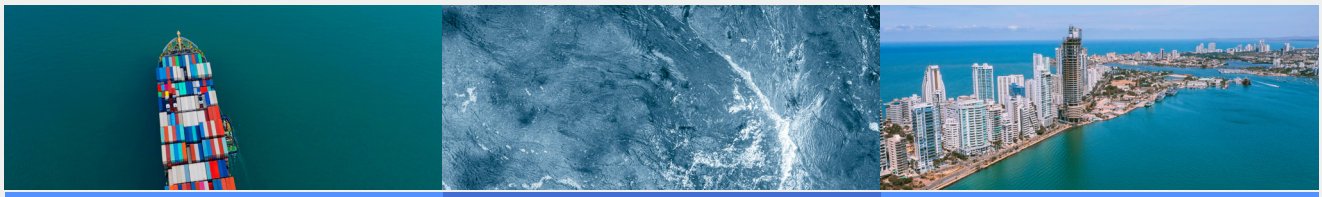


FIGURE 1 | **The ocean economy in numbers**



80%

of global trade volumes are transported by sea, underpinning the gloabl economy

$3 trillion

The estimated annual economic value of ocean-based industries every year by 2030

2.75 billion

people or over a third of the world population live within 100 km of the coast

Over 3 billion

people globally depend on seafood as a significant source of protein and other essential micronutrients

Over 95%

of international communications are carried throught submarine fiber optic cables

120%

The expected increase in ocean sector employment between 2010 and 2030

At the same time, accelerating climate pressures and nature loss expose ocean-dependent markets, communities and infrastructure to escalating risks. The investment case, therefore, hinges on doing two things at once: allocating capital toward opportunity areas and actively managing ocean exposure so returns are not undermined.

Despite its scale and strategic relevance, the ocean economy remains relatively underallocated in global capital markets. It sits at the intersection of climate adaptation, resource efficiency, food security and infrastructure modernization – trends that are likely to persist regardless of the global growth cycle. For investors, the opportunity is not just thematic alignment; it is the chance to back assets and services that will be needed as constraints tighten, while pricing and managing ocean-related risk more explicitly.

Capital is starting to move, albeit from a low base. Global green, social, sustainability and sustainability-linked (GSSS) bonds labeled with water or blue marks between 2015 and 2024 totaled $19 billion, with 58% issued in the period 2023-2024.[8] This signals a recent and significant increase in interest in these investments.

When governed and financed responsibly, the ocean economy offers one of the most credible pathways to align long-term investment performance with ecological resilience and economic necessity. This will require meaningful progress in ocean finance, including clearer investment theses and better tools to quantify and size opportunities across the ocean economy. Existing progress has focused on direct conservation and restoration,[9] while others have highlighted project finance for both small- and large-scale infrastructure,[10] insurance products to mitigate risks,[11,12] the financing of early-stage innovation to scale up solutions,[13,14] the reissuance of debt and bonds,[15] or even economic growth[16] and job creation projections.[17] These recent publications help raise awareness around opportunities and financing methods, but have not yet driven the needed level of investment.

With the private sector driving much of this investment, today's business decisions will determine whether ocean-based growth undermines ocean health or poses an opportunity to transition towards models that conserve and restore it while driving long-term business value, social prosperity and resilience.

To maximize the sustainable growth of the ocean economy, businesses and capital providers must begin to:

- Recognize both existing/potentially unintentional and future exposure to the ocean economy, as well as its risks, and how to mitigate them.
- Better understand the opportunity to make more intentional plays in the ocean space and be early movers on industries with potential for growth and demonstrated need for partners and financing.

1 Ocean economy definitions

To better understand the opportunities and risks the ocean economy presents, it is important to first define what the ocean economy refers to. Multiple organizations use terms such as “ocean economy”, “blue economy”, and “sustainable” or “regenerative” blue economy, with varying industry scopes and levels of adherence to sustainability taxonomies. This paper proposes three functional categorizations:*

1. **Total ocean economy** – encompasses any economic activity taking place in marine environments or otherwise relying on/benefiting from their presence.
2. **Low-carbon ocean economy** – refers to any low-carbon and/or transitioning ocean economy activities.
3. **Regenerative ocean economy** – refers to ocean economy activities that contribute to “nature positive” outcomes (i.e. dedicated to restoration/ conservation or having regenerative elements).

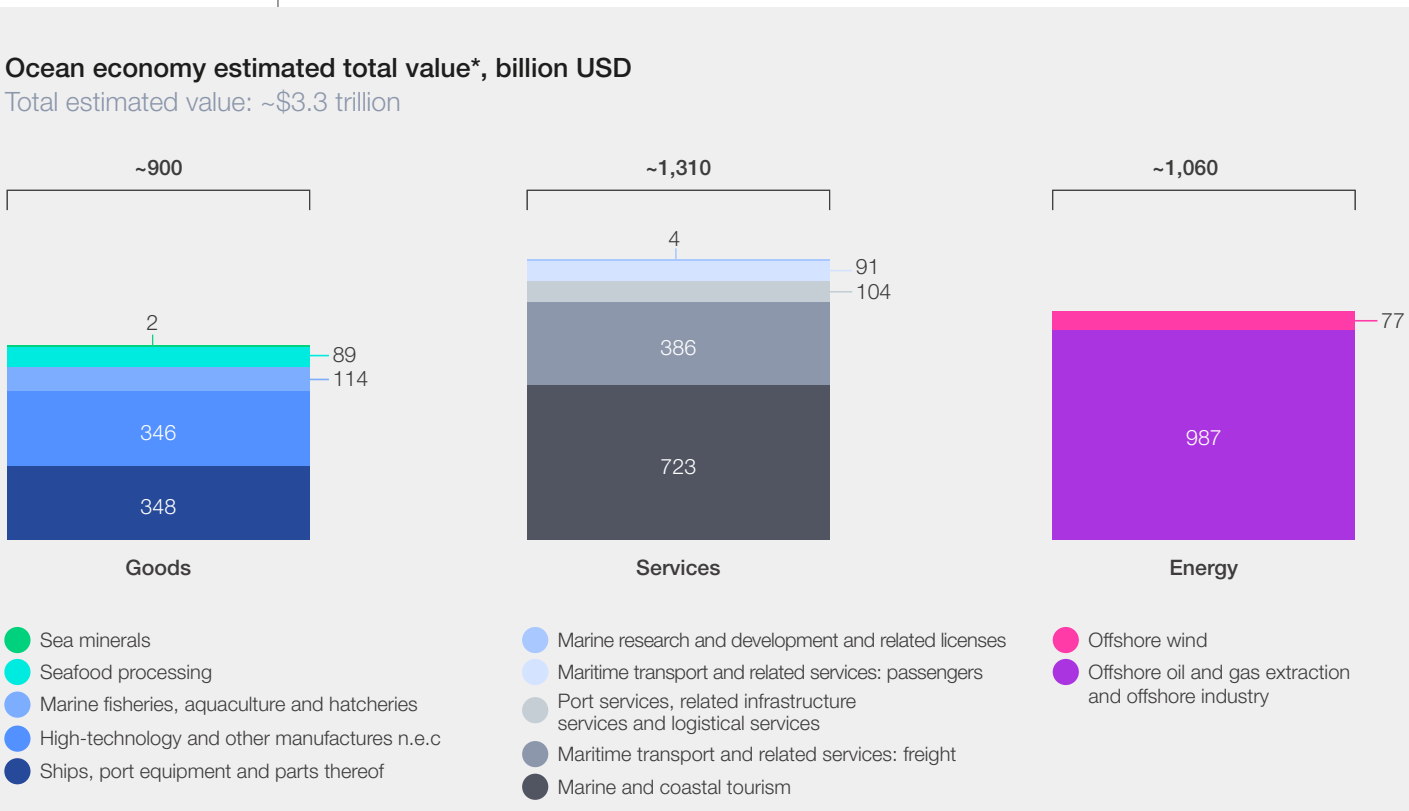
Across each segment of the ocean economy, clear growth trends and investment opportunities are emerging.

***Note:** These categorizations only address the degree to which activities are decarbonized and/or aligned with nature positive outcomes and do not consider social elements such as inclusion and equity. We acknowledge that this social taxonomy should ultimately be included in any official ocean economy taxonomy and that our categorizations are simplified for reader understanding and due to lack of universal agreement on ocean/blue economy nomenclature.

Total ocean economy

The current value of the ocean economy is estimated at over $3 trillion (Figure 2), based on data from the United Nations Conference on Trade and Development (UNCTAD) Data Centre,[18] BloombergNEF,[19] and Organisation for Economic Co-operation and Development (OECD).[20]

FIGURE 2 **Estimated total value of the global ocean economy**



Note: *Value of goods, services, and energy is represented by exports, current value, and investments/GVA, respectively.

Source: United Nations Conference on Trade and Development (UNCTAD) Data Centre, BloombergNEF, and Organisation for Economic Co-operation and Development (OECD)

Even this figure likely understates the ocean's true value, as it excludes the domestic consumption of goods, reliance of Special Economic Zones (SEZs) and industrial hubs on ocean and ports, and valuation of ocean-related startups.

BOX 1 **Special Economic Zones (SEZs)**

Ports frequently serve as the foundation for free trade zones, special economic zones and industrial clusters, amplifying their economic impact far beyond cargo handling. The Port of Shanghai, for instance, anchors the Pudong Free Trade Zone in China, which includes industrial areas such as Waigaoqiao, Yangshan and Lingang.

While the port itself manages immense cargo throughput, the surrounding Pudong zone generated approximately RMB 1.78 trillion ($248-250 billion) in GDP in 2024,[21] highlighting the substantial value created through port-adjacent trade, logistics and industrial activity. Similarly, the Port of Jebel Ali in the United Arab Emirates supports the Jebel Ali Free Zone (JAFZA), which contributes roughly 36 % of Dubai's GDP and facilitates $190 billion in annual trade.[22]

However, even ports already recognized as economically significant often understate their true contribution when measured in isolation. The Port of Rotterdam in the Netherlands, for example, was found to generate nearly twice the previously calculated GDP impact, totaling approximately €45.6 billion ($50 billion) – or 6.2 % of national value added – when accounting for additional economic activity enabled by the port.[23] This pattern is likely mirrored in other major port hubs worldwide, where port infrastructure catalyzes clusters of trade, industry and services that conventional ocean economy estimates fail to capture.

BOX 2 **Economic contribution of ocean start-ups**

The 1000 Ocean Startups (1000OS) is the global ocean impact innovation ecosystem, convening 62 entrepreneur-support organizations that advance "ocean-positive" start-ups. Coalition members back innovation across offshore renewables, alternative fuel shipping, aquaculture, nature-based restoration and circular-ocean solutions – sectors where early-stage valuations and scaling potential could materially expand the recognized ocean economy.

1000OS reported in June 2025 that its members had supported 550+ start-ups so far, with a combined minimum estimated total enterprise value of $11.25-14.64 billion.[24] The valuation of all ocean-related startups is estimated to be $120 billion, which although still small compared to the total ocean economy, has the potential to grow to roughly $1.3 trillion based on even conservative historical climate tech valuation-to-revenue multiples.[25]

Official estimates of the ocean economy tend to rely on metrics such as export values, often under-capturing the value of emerging technologies and future market potential. As these start-ups scale and attract capital, their innovations could push the ocean economy well beyond conventional figures as new markets mature.

Low-carbon ocean economy

Although decarbonization solutions and decarbonized alternatives theoretically exist for all ocean economy activity, the low-carbon ocean sectors expected to most meaningfully drive decarbonization are ocean-based renewable energy, ocean-based transport and marine carbon dioxide removals (mCDRs). The total decarbonization potential of these sectors is estimated at 0.67 to 1.72 $GtCO_2$ annually by 2030, and 2.16 to 9.2 $GtCO_2$ annually by 2060.[26]*

***Note:** The original report that identifies and sizes the decarbonization potential of these sectors also includes ecosystem restoration/conservation and fisheries/aquaculture/dietary shifts, but they have been excluded from this section as they are addressed later in the report.

In terms of market size, these sectors total roughly $120 billion. Offshore wind investment reached a record $77 billion in 2023;[27] about 8.5%[28] – equivalent to $41 billion – of the global shipping fleet is now alternative fuel-ready; and investment in mCDRs hit a high of $100 million in 2024.[29]

Regenerative ocean economy

The regenerative ocean economy is a wholistic concept encompassing a systemic, interconnected and seascape-level approach to governing the human-ocean relationship. The regenerative blue economy is still in the concept phase with efforts led by the International Union for Conservation of Nature (IUCN) and the World Economic Forum's Global Future Council on the Regenerative Blue Economy. It is not currently possible to assess the overall economic contribution of the regenerative ocean economy, especially as private investment into relevant projects is small and not always 100% allocated to regenerative measures, but instead split between traditional activities and regenerative elements. However, important investments are being made in both direct nature restoration projects and commercial activities with regenerative elements.

These definitions and a better understanding of what "counts" as part of the ocean economy is crucial to businesses and capital providers, many of whom mistakenly believe that the ocean economy is limited to conservation efforts (regenerative ocean economy). This decreased literacy causes businesses and investors to overlook substantial, investable opportunities across the ocean economy.

BOX 3

Embedding regenerative practices in offshore wind projects

Recognizing their dependency and exposure to the marine ecosystems, many offshore wind developers, including Ørsted, Iberdrola and Vattenfall, have committed to a net-positive impact on biodiversity for every new project commissioned from 2030 onwards.

Ahead of this timeline, many regenerative projects have already been launched. For example, Ørsted's ReCoral seeks to scale up coral restoration on offshore wind farms by transferring lab-cultivated coral onto metal frames and settling them on wind power infrastructure.[30] Other examples of nature-inclusive design include Vattenfall's Hollands Kust Zuid in the Netherlands, RWE's Kaskasi offshore wind farm in Germany, Equinor's Hywind in Scotland, Ørsted's Borssele I & II in the Netherlands, and the successful re-introduction of flat oysters by the Rich North Sea in the Blauwwind wind farm

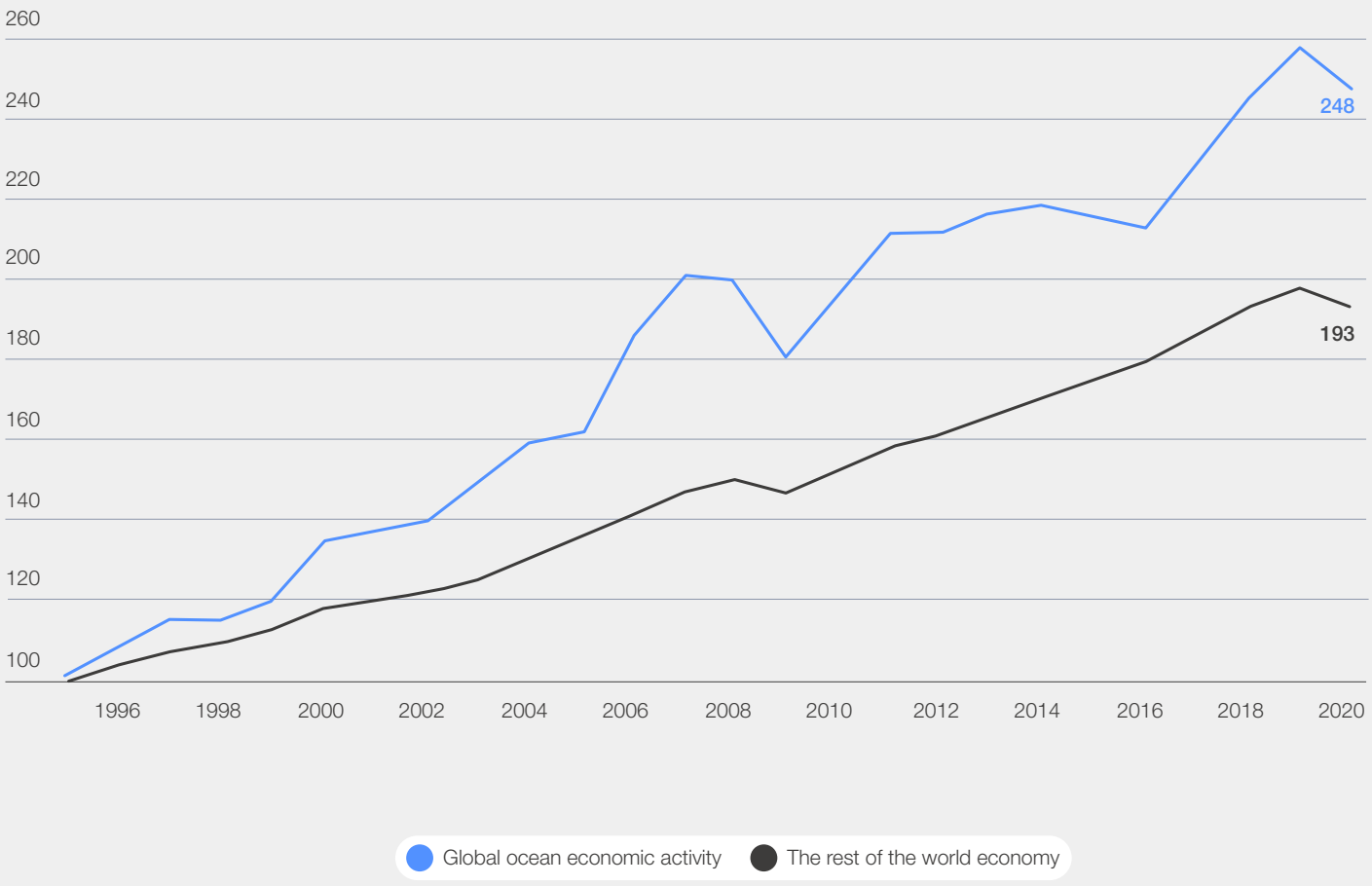
By giving back to the environment and communities, these methods also help garner local buy-in for projects, which in some cases can offset what would have been the cost of delays. Siting conflicts are among the leading causes of project delays in the renewables sector, often costing developers $2-3 million per year in financing charges for every year a project is delayed.[31] A similar study in the UK found that consenting delays can cost developers up to £200,000 ($255,000 per day).[32]

2 Ocean economy opportunities

Many parts of the ocean economy offer impressive opportunities for economic development with attractive returns. The ocean economy has consistently grown at a faster pace than the overall economy, a trend that has not only stayed constant but exacerbated in recent years, with ocean economic activity growing to 1.3 times that of the rest of the world economy in 2020 (Figure 3).[33]

FIGURE 3 **Growth of global ocean economic activity vs the rest of the world economy**

Global ocean economic activity growth Index 1995 = 100, 1995-2020



Source: UN Trade and Development (UNCTAD) 2025 based on OECD Ocean Economy Monitor, preliminary estimates, June 2024.

This growth is expected to moderate towards 2050, and will be driven by two areas: established, fast-scaling investment themes – such as aquaculture, desalination and water treatment, decarbonization and digital infrastructure; and emerging industries, including biotech and other early-stage innovations. Several incumbent ocean economy sectors have long driven growth, illustrating the ocean's steady – and often fast-paced – pipeline of opportunities and returns for businesses and capital providers alike (Table 1).

TABLE 1 | **Growth of key ocean economy investment themes**

Sector	Description/metric	Start year	End year	Ave annual growth from start year
Ocean economy	Value of ocean-based economic activity (goods and services) (source: UNCTAD[34])	2015	2020	3%
Non-ocean economy	Value of all other non-ocean based economic activity (source: UNCTAD[35])	2015	2020	2.1%
Aquaculture	Value of ocean-based food production including fisheries, aquaculture and hatcheries source: UNCTAD[36])	2015	2020	2.1%
Desalination	Installed desalination capacity (multiple sources[37],[38])	2015	2020	2.3%
Offshore wind	Installed offshore wind capacity (source: IEA[39])	2015	2020	37%
Decarbonization of shipping/ports	Proxied by share of "alternative fuel-ready" global fleet (source: World Fleet Register[40])	2015	2020	15%
Digitalization/ digital infrastructure	Proxied by amount of VC funding of AI/digital tools in logistics/shipping (multiple sources[41,42])	2015	2020	360%
Ocean tourism	Value of ocean/marine tourism services (source: UNCTAD[43])	2015	2019 (2020 not included due to impact of COVID)	6%

Aquaculture

Aquaculture has become a multi-trillion-dollar investment prospect, driven by its expanding role in sustainable food security.[44, 45] Already the world's fastest-growing food production sector, projections point to output reading 255 Mt by 2050 (3.8% CAGR) in an upside scenario, well beyond historical constraints.[46,47]

Aquaculture has the lowest carbon footprint among animal protein sectors,[48] with low-trophic production – particularly seaweed and bivalves – offering strong growth aligned with sustainability mandates. These systems can provide ecosystem services such as water filtration and nutrient removal, and can support ocean health outcomes when developed responsibly, with market forecasts pointing to double-digit positive compound annual growth rate (CAGR) for the global seaweed sector over coming decades.[49]

Capturing this opportunity will depend on scaling operations while strengthening performance, environmental safeguards and resilience. Under combined scenarios, projected growth is expected to generate substantial social value, creating tens of millions of jobs globally by 2050.[50, 51]

Water desalination and water treatment

Chronic water scarcity has become an increasingly pressing global issue driven by declining freshwater availability and rising demand from population growth, food systems and energy use. As a result, the need for desalination and water treatment technologies has increased sharply: global desalination and water reuse capacity has grown by 40% and 52% since 2020, respectively.[52] This rate of growth is higher even than other fast-growing sectors like power generation, whose installed capacity grew roughly 20% over a similar time period.[53]

Deployment and investment are concentrated in historically water-stressed regions such as the Middle East and Africa. One of the largest desalination facilities in the world, Ral Al-Khair in Saudi Arabia, has a capacity of nearly 3 million m^3/day, costing a total of over $7 billion in CAPEX expenditures, inclusive of power facilities. The Ral Al-Khair facility was originally built for the state-owned Saline Water Conversion Corporation (SWCC), but has since revealed plans[54] to partially privatize the plant, signaling that the need for private sector partners in water infrastructure may grow in the near future.

Decarbonization: Offshore wind

Offshore wind is emerging not only as an engine of the clean energy transition, but as a catalyst for skilled jobs and new industrial value chains, while supporting biodiversity and ecosystem restoration when designed responsibly. Despite recent headwinds, by 2030, offshore wind is projected to grow from the current 94 gigawatts (GW)[55] to 230 GW and to 2,000 GW by 2050.[56] Investors are already committing significant capital to this

expansion, with about $39 billion in offshore wind financing recorded in the first half of 2025 alone, exceeding the total for all of 2024.[57] Goldman Sachs' long-term framing estimated this number to rise significantly to nearly $6.6 trillion as part of the broader multi-decade net-zero investment need.[58]

Decarbonization: Shipping and ports

The transformation of shipping toward low- and zero-emission fuels is opening new markets for green fuels, vessel innovation and digitalization. Decarbonizing international shipping is expected to require cumulative investments of approximately $1.2-1.6 trillion from 2030 to 2050, including both ship-side technologies and land-based alternative fuel infrastructure, with near-term investments focused on low-carbon fuels and vessel retrofits.[59]

Ports sit at the centre of this opportunity, evolving from traditional logistics hubs into energy and innovation platforms that enable clean fuel production, renewable integration, electrified operations and circular business models. Prioritizing decarbonization and nature strategies could unlock over $54 billion in cumulative cost savings and new revenue by 2030 across the port value chain,[60] while cumulative modernization for electrification and shore power needs across global ports could reach $1-2 trillion by 2050.[61]

Digital infrastructure and digitalization

The rapid expansion of the digital economy is directly relevant to the ocean economy, both through physical infrastructure – such as submarine fiber-optic cables and offshore data facilities – and through the digitilization of ocean-dependent industries. Sectors including shipping, ports and coastal industrial zones are increasingly reliant on digital systems to manage logistics.

Digitilization of ports, logistics hubs and coastal industrial clusters represents a sizeable opportunity, with the global smart ports market alone estimated at $2 billion.[62] Yet performance remains constrained by fragmented data, limited interoperability and weak coordination across actors. These gaps increase exposure to disruption and inefficiency across ocean-dependent value chains.

Shared digital platforms, common data standards and trusted governance frameworks can reduce transaction and compliance costs, improve coordination, and enable faster responses to climate, security and supply-chain shocks. These digital solutions strengthen the long-term resilience and investability of ocean-dependent industries, while themselves offering an attractive investment opportunity.

Tourism

Tourism is one of the most economically significant components of the ocean economy, accounting for more than $700 billion in annual value and over half of ocean-related services.[63] Within the broader tourism and travel sector, coastal and marine tourism captures a disproportionately large share, representing approximately 50% of global tourism spending.[64] Coastal and marine tourism also supports a large employment base, directly and indirectly sustaining approximately 100 million jobs worldwide, equivalent to roughly 3% of the global workforce.[65]

Demand for coastal and marine tourism continues to grow, driven in part by rising discretionary travel and a growing preference for water-based and nature-oriented experiences.[66] This shift has contributed to the expansion of ecotourism and destination models that link visitor activity with conservation and environmental awareness.[67]

At the same time, coastal and marine tourism is particularly vulnerable to climate and nature-related risks. Ecosystem degradation – including beach erosion, coral loss and declining water quality – can directly reduce visitor numbers and spending.[68] Maintaining the economic value of these destinations therefore depends on targeted investment that supports conservation, restoration and climate resilience, while diversifying away from volume-driven growth.

Emerging opportunities

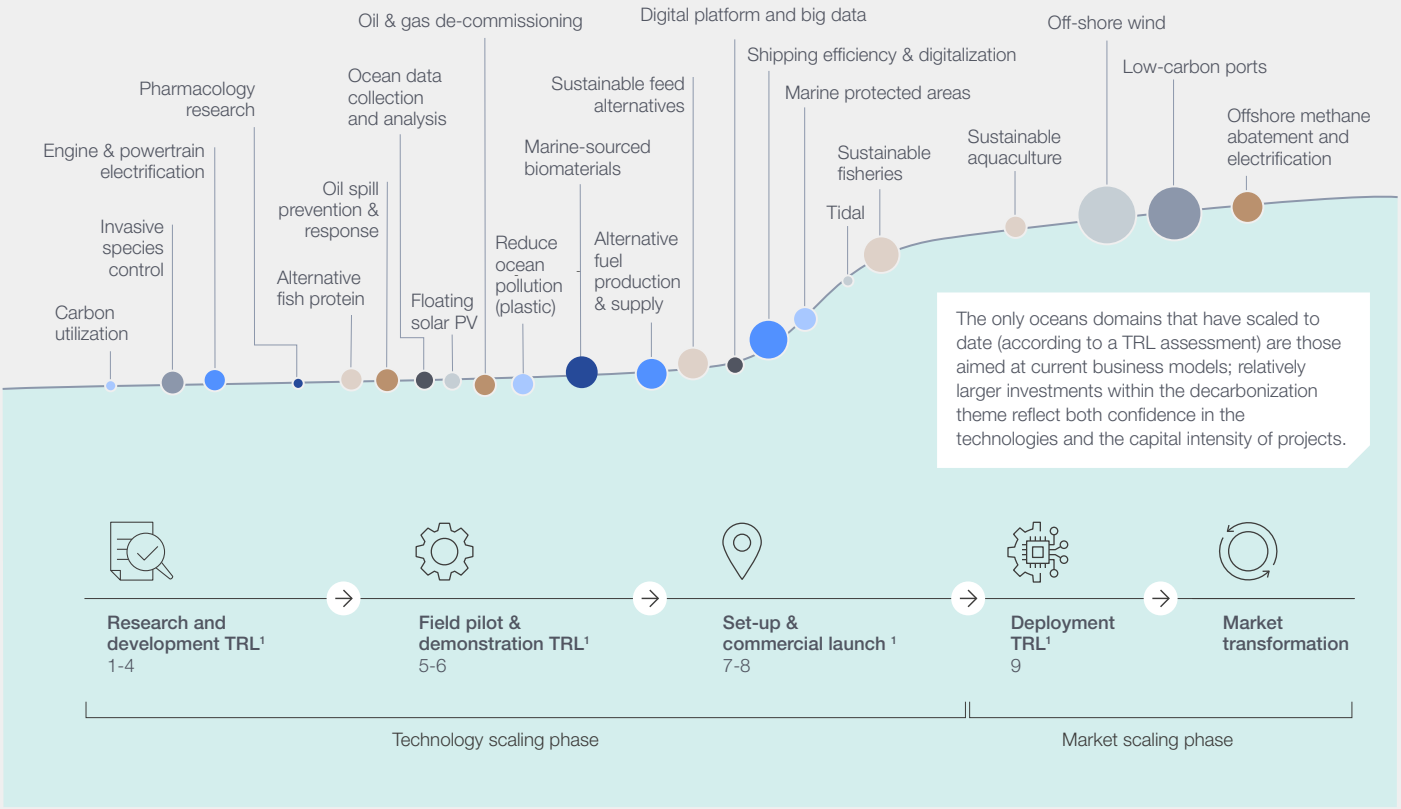
The next wave of the ocean economy resembles early-stage infrastructure investing: technical feasibility is increasingly clear, but commercial maturity is uneven. This creates higher perceived risk today, alongside outsized long-term option value for those that help standardize technology, reduce policy and permitting friction, and build the enabling services that make projects bankable. Emerging ocean sectors will require these to move from demonstration to commercial scale and attract sustained capital deployment (Figure 4).

FIGURE 4 | **Technology readiness levels and investment sizes of ocean economy sectors**

Illustrative Non-Exhaustive

Reflecting an overall early stage of development, domains in the ocean economy are clustered in the pilot and demonstration phase; more funding is needed to show that emerging technologies work in the field.

The relatively small ticket size of recent investments creates space for investors to support more and more varied pilots and demonstration projects to push to scale.



Investible Themes

- Renewable Energy
- Ocean conservation
- Transport
- Extractive industries
- Infrastructure
- Circular economy and blue technology
- Sustainable seafood
- Enablers

Relative size of recent investments²

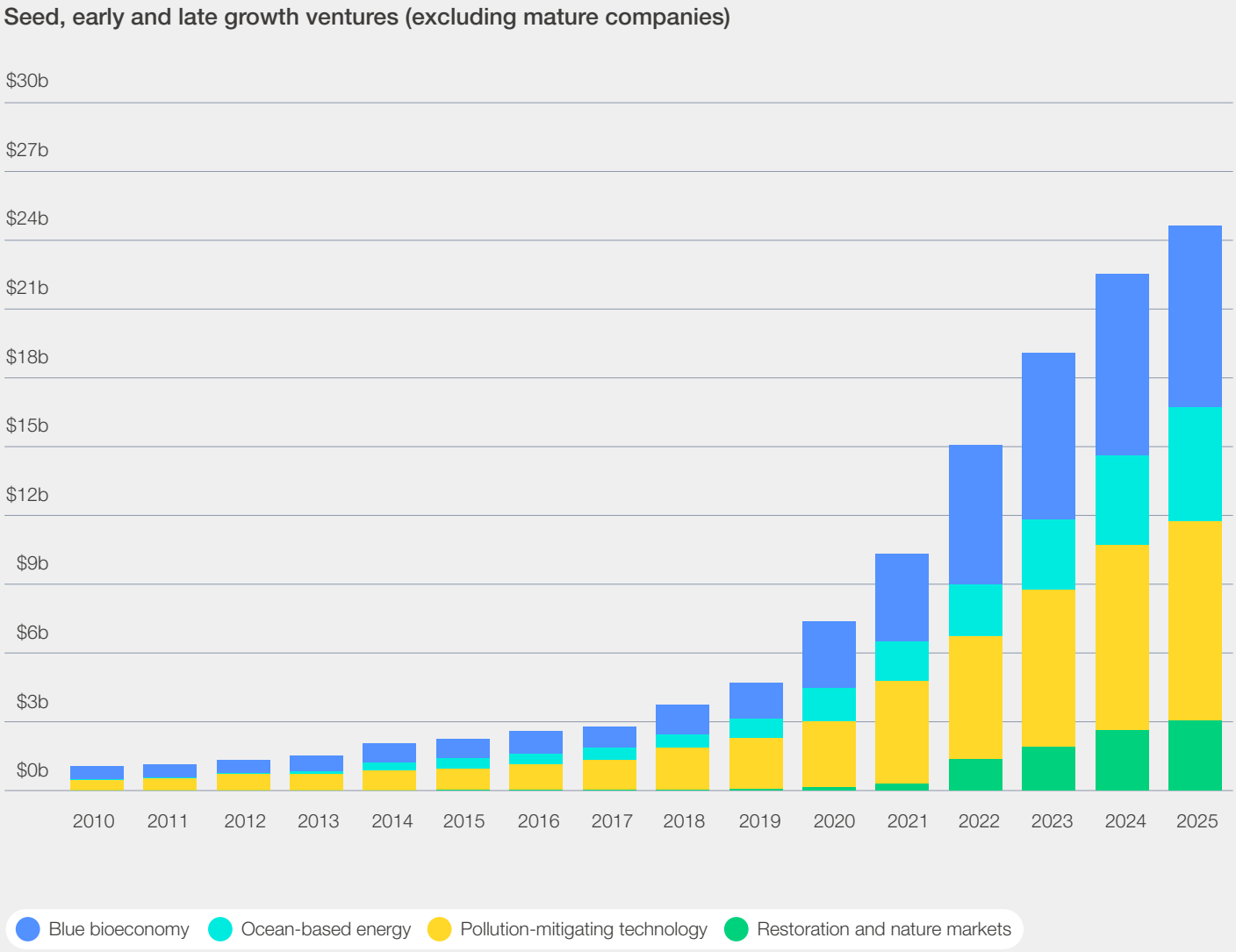
<$50M ~$200M <$500M

Notes: 1. TRL = technology readiness level; **2.** Relative size of investments based on recent industry news on acquisitions, investments, and large-scale projects; focus on high-profile investments

Source: Based on expert interviews and consultations conducted March – August 2025

Beyond the dominant trends of decarbonization and digitalization already covered, four emerging investment areas are shaping early-stage ocean innovation: the blue bioeconomy, ocean-based energy, restoration and nature markets, and pollution-mitigating technology. Between 2010 and 2025, cumulative enterprise value across seed, early and late growth ventures in these areas rose from $1.1 billion to $24.7 billion (Figure 5). This growth reflects a deepening pipeline of ventures moving beyond proof-of-concept toward early commercial scale, despite shifts in the mix across opportunity areas.

FIGURE 5 | **Cumulative early-stage enterprise value of emerging ocean opportunities**



Methodology: Cumulative enterprise value of 944 seed, early and late growth ventures across four emerging ocean opportunity areas, 2010–2025 (excluding mature companies). Categories were defined using Dealroom.co's tagging taxonomy, with each venture assigned to a single primary opportunity area to avoid double-counting. Values reflect only ventures with Dealroom-reported valuations. Total enterprise value across these opportunity areas is therefore likely higher

Source: Data from Dealroom.co and 1000 Ocean Startups.

Blue bioeconomy

The blue bioeconomy is emerging as a practical engine of economic resilience, converting renewable aquatic resources into higher-value products spanning pharmaceuticals, nutraceuticals, biomaterials and bioenergy.[69] National strategies are already leaning into this potential; for example, Canada's ambition to grow its ocean economy fivefold to $220 billion by 2035, and subsectors such as macroalgae cultivation are increasingly framed as major growth frontiers, with the global seaweed industry expected to generate $28 billion annually by 2050.[70]

In the EU, the sector already supports 4.45 million jobs, with efforts focused on developing higher-value local value chains rather than commodity dependence.[71,72,73,74] A parallel shift towards a circular bioeconomy is also taking place.[75] Tidal Vision, a start-up that upcycles crustacean shell by-products into chitosan-based materials used in industrial applications, including water-related uses, recently completed a $140 million Series B investment round demonstrating how circular marine feedstocks can underpin commercially viable, high-margin bio-based chemistry platforms.

Ocean-based energy

Ocean-based energy – especially tidal stream, wave and longer-horizon options such as ocean thermal energy conversion (OTEC) – remains earlier-stage than offshore wind, but it offers a distinct strategic value: predictable generation profiles in some resources (notably tidal), relevance for islands and remote coastal grids, and the potential to integrate into hybrid offshore systems that share infrastructure and grid connections.

While technically plausible, bankability remains a constraint, including revenue certainty, standardized project structures, and risk allocation that lenders and institutional investors can price. Industry tracking indicates the sector is progressing from one-off prototypes toward pilot farms and early commercial arrays, a transition phase where standards, permitting pathways, and contracting templates become decisive for scaling.[76, 77]

Restoration and nature markets

Restoration and nature markets are shifting from grant dependence towards blended, performance-based finance, provided integrity is credible and benefits are measurable. Coastal ecosystems such as mangroves, tidal marshes and seagrass can generate financeable value through combinations of carbon revenues, resilience funding, insurance-linked mechanisms and public procurement, alongside co-benefits such as fisheries enhancement and coastal protection. However, with nearly half of current protected-area funding coming from bilateral public donors and a growing share from philanthropy, the scale mismatch underscores a clear imperative: mobilizing private capital is critical to scaling coastal ecosystem restoration and protection.

In parallel, standards bodies are formalizing methodologies and market infrastructure, which is essential to build demand, reduce reputational risk, and support larger-scale capital allocation.[78] The medium-term opportunity is not limited to credits or projects, it is the supporting services and market plumbing that make portfolios investable at scale. Monitoring, reporting and verification (MRV), project development capacity, risk analytics and pipeline aggregation vehicles are essential to transform bespoke pilots into repeatable investment programmes.[79]

Pollution-mitigating technology

Pollution-mitigating technology is becoming a strategic frontier in the wider ocean economy with increasing demand from public health concern, tightening regulation, and rising liability and remediation costs.[80] The Lancet Commission underscores that all types of pollution remain a major global health burden, reinforcing the direction of travel toward stronger policy action and enforcement.[81] This is creating investment opportunities for detection, filtration, capture and substitution technologies across wastewater systems, industrial discharge points, ports, shipping and coastal infrastructure.

The United Nations Environment Programme's global assessment highlights escalating damages associated with marine litter and plastic pollution, while its solutions work emphasizes that substantial reductions are achievable using existing approaches by "turning off the tap" upstream rather than relying on costly downstream clean-up.[82,83] Treated as essential infrastructure, prevention-focused technologies reduce future liabilities, lower compliance risk and protect ecosystem services before losses compound.[84]

3 Ocean economy risks

The risks associated with the ocean economy are not confined to a narrow set of marine industries, nor are they future or hypothetical. They are already embedded across global trade, infrastructure, real estate and supply chains. Understanding these risks is therefore less about identifying new exposure than recognizing where value is already at stake, and where more deliberate management can unlock resilience and improve investment outcomes.

Many investors underestimate their ocean exposure due to narrow definitions of what constitutes "marine" or "maritime" activity. In practice, any real estate in a coastal nation is ocean-exposed, as are goods and materials transported by sea, major coastal infrastructure such as offshore energy, and a wide range of projects and businesses that interact with – or depend on – the ocean at some point in their supply chains.

Maritime trade illustrates how ocean risk is already systemically priced into the global economy, often implicitly and inefficiently. In maritime trade alone, the expected value of trade disrupted (EVTD) is $191.5 billion (nearly 1% of all global trade) annually, with ultimate economic losses estimated at roughly $14 billion annually through delays, rerouting, insurance premiums and higher freight costs.[85] Climate change-specific risks also have material impact on port and shipping economics. The University of Oxford finds that 86% of major ports globally are exposed to more than three types of climatic and geophysical hazards, including tropical cyclones, flooding, earthquakes and extreme marine conditions.[86] Climate-related port downtime alone places approximately $67[87] to $81 billion[88] of global trade at risk each year, with broader economic activity exposed to losses exceeding $120 billion annually.

Similar dynamics are evident on land, where growing concentrations of people, capital and infrastructure along coastlines are increasing the value of assets exposed to ocean-related risk. An estimated 2.75 billion people (roughly one third of the global population) already live within 100 km[89] of coastline and urban land in low elevation coastal zones (LECZs) has been shown to expand at a significantly faster rate than in inland,[90] implying that the share of coastal population and infrastructure will continue to grow, increasing the value of assets exposed to ocean risk.

The World Wildlife Fund and Metabolic estimate that up to $4 trillion of global coastal infrastructure will be at risk due to declining ocean health and climate change over the next 15 years in a business-as-usual case.[91] These risks and losses are already being felt. For example, in coastal tourism infrastructure, over 90% of resorts surveyed in the Maldives have experienced moderate to severe beach erosion, with roughly 60% experiencing considerable infrastructure damage due to climate-related events.[92] These damages are likely to result not only in higher construction and maintenance costs, but also in reduced occupancy and revenue, putting pressure on businesses and assets. One study estimated that properties in high or very high flood risk areas experience a 15.6% reduction in value and that the implicit price of being located close to an eroded beach is roughly 26%.[93] These impacts do not indicate that coastal assets are inherently uninvestable, but rather that failure to integrate ocean and climate risk into planning, design, and financing is already eroding value.

Crucially, these risks are neither unavoidable nor unmanageable. There are sufficient mitigation tools that can be leveraged. Financial tools such as parametric insurance schemes are one such instrument uniquely suited to industries with high levels of exposure to natural environments like the ocean. This insurance subsector is expected to grow significantly due to increasingly frequent natural disasters and climate-related events, reaching an estimated $34.4 billion.[94]

By providing rapid liquidity following extreme events such as storms, storm surge, or abnormal wave conditions, parametric insurance can reduce downtime, stabilize revenues and improve the bankability of coastal and ocean-dependent assets, thereby supporting continued investment in a high-risk but high-value economic domain. In this context, effective ocean risk management is not a defensive exercise, but a prerequisite for scaling investment, lowering the cost of capital, and sustaining long-term value creation across ocean-dependent sectors. As with other complex systems, competitive advantage will accrue to those actors who recognize ocean exposure early and invest accordingly.

4 Next steps for businesses and capital providers

Much of the private sector is connected to the ocean economy, often without fully recognizing it. To capture opportunities and avoid mispriced risk, businesses and capital providers should:

- **Conduct market research** to explore opportunities in high-growth ocean sectors and investment theses. Many of these themes offer potential early-mover advantages, access to favorable finance, and a reliable project pipeline.
- **Consider blue financial instruments** to tap into emerging opportunities – although nascent, these instruments have demonstrated strong market demand and even instances of oversubscription in recent years.
- **Assess existing ocean exposure** and take action to mitigate related risks as a foundation for sustained investment. For capital providers, this could involve portfolio reevaluation to ensure risks are accurately priced. Business owners could similarly assess direct and indirect exposure, such as shipping delays or outages, and strengthen resilience through insurance and operational measures.
- **Establish themselves as an ocean champion** within ocean economy networks by showcasing ocean-positive business strategies, joining global dialogue and collaborating with peers.

Across the ocean economy, companies are looking for practical ways to manage climate and nature risks while strengthening resilience and increasing business value. Progress remains fragmented and below the scale required. The World Economic Forum helps coordinate action through it's initiative, *Accelerating Critical Transformations for the Ocean (ACT Ocean)*, by:

- **Supporting businesses in key ocean sectors** like energy, ports and shipping, food and tourism to identify concrete actions that conserve and restore ocean health while improving business performance and creating opportunities for the economy and communities.
- **Providing a platform that fosters collaborations** between businesses, governments, financial institutions, academia and civil society to share knowledge, test and scale solutions that drive systemic change for ecological and social impact.
- **Shaping the future of the ocean economy** and its contributions to the global economy by anticipating and supporting technological, policy and financial breakthroughs that enable transformations at scale.

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