

AN INPUT PAPER TO THE 2021 UN CLIMATE CHANGE CONFERENCE (COP 26)

THE OCEAN-CLIMATE NEXUS

A BLUEPRINT FOR A CLIMATE-SMART OCEAN TO MEET 1.5°C



**OCEAN
STEWARDSHIP
COALITION**



“

**TODAY'S IPCC WORKING
GROUP 1 REPORT IS A CODE
RED FOR HUMANITY.**

António Guterres, Secretary-General, United Nations

**YOU CANNOT PROTECT
THE OCEANS WITHOUT
SOLVING CLIMATE CHANGE,
AND YOU CAN'T SOLVE
CLIMATE CHANGE WITHOUT
PROTECTING THE OCEANS.**

Hon. John Kerry, US Special Presidential Envoy on Climate

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FOREWORD

"The alarm bells are deafening, and the evidence is irrefutable" — the dangerous situation we find ourselves in, as outlined in the recent Intergovernmental Panel on Climate Change (IPCC) report ([IPCC, 2021](#)), is nothing less than, in the words of United Nations Secretary-General António Guterres, "a code red for humanity" ([United Nations, 2021](#)). Without an immediate, rapid and large-scale low-carbon transformation, meeting the Paris Agreement and limiting warming to 1.5°C — or even 2°C — will be beyond reach ([IPCC, 2021](#)). Further, concerted and widespread political, societal and business action is needed to restore nature with nearly 1 million species at risk of extinction from human activities ([Dasgupta, 2021](#)). Never has global collaboration been so critical.

The vital role of the ocean in delivering on our planetary crises — from climate change to biodiversity loss — and the broader UN Sustainable Development Agenda has become increasingly recognized. To facilitate the necessary multi-stakeholder collaboration to scale up ocean-based solutions, the United Nations Global Compact launched the Sustainable Ocean Business Action Platform in 2018. Following a year of collaboration with hundreds of stakeholders worldwide, the UN Global Compact then launched the Sustainable Ocean Principles during the UN General Assembly week in 2019. The Sustainable Ocean Principles build upon the Ten Principles of the UN Global Compact to create a framework for businesses to assess their impact on the ocean. Together with the "Ocean Stewardship 2030" roadmap, the UN Global Compact has created a framework for companies to positively contribute to combating our planetary crises and delivering on the UN Sustainable Development Goals.

The UN Global Compact launched the Ocean Stewardship Coalition at the UN General Assembly in 2021 to bring together the private sector alongside UN agencies, academia, Governments and non-governmental organizations with renewed urgency. Only through collective, global action can our current planetary crises be addressed. With the 2030 deadline for the Sustainable Development Goals fast-approaching, everyone must contribute to rapidly transforming to a net-zero, equitable and resilient economy — and the private sector has a key role to play.

Ocean-based climate mitigation and adaptation solutions — from offshore renewable energy to restoring blue carbon ecosystems¹ — can significantly support the transformative change needed and also offer opportunities for socio-economic and business growth. As ocean economy sectors face interconnected challenges, a global multi-stakeholder coalition is urgently required to drive meaningful change while leveraging cross-sectoral synergies, innovation and knowledge.

The work of the Blue Road to COP 26, launched by the Action Platform in March 2021, will continue under the auspices of the new Ocean Stewardship Coalition. The Blue Road to COP 26 focused on four workstreams — zero-carbon maritime transport, offshore renewable energy, low-carbon blue food and ocean nature-based solutions — bringing a group of over 100 stakeholders from business, policy, non-governmental organizations and science together. These four workstreams have resulted in four separate Blue Road to COP 26 briefs, in which the actions being put forward in this Blueprint are founded in.

- Seaweed as a Nature-Based Solution for Climate Change: Vision Statement
- A Roadmap To Integrate Clean Offshore Renewable Energy into a Climate Smart Marine Spatial Plan
- Towards a Green and Decent Maritime Transport Industry to Meet 1.5°C
- A Guide: Setting a Science-Based Emission Reduction Target in the Seafood Sector (2022)

The Ocean Stewardship Coalition will continue its work on the Blue Road to COP 27 and 28, mobilizing and raising the bar of sustainable ocean business during this deciding decade.

Sturla Henriksen

Special Advisor, UN Global Compact

Erik Giercksky

Head, Ocean Stewardship Coalition, UN Global Compact

1. Refers to ocean ecosystems - such as mangroves, seagrass, seaweed, and coral reefs - which provide highly valuable ecosystem goods and services, including capturing carbon ([UNEP, 2021](#)).

KEY MESSAGES

The science is clear: We are in a climate and nature emergency. The ocean holds solutions to address both crises (Hoegh-Guldberg et al., 2019). Put simply: ocean action is nature-climate action. While the international community's recognition of the role of the ocean is steadily increasing,² urgent and accelerated action is needed to leverage the full capacity of both the political and business communities to make the ocean a central focus in addressing the climate and biodiversity crises — and the 2030 Agenda for Sustainable Development.

A 'climate-smart ocean' approach has the potential to support a net-zero, resilient, equitable³ and nature-positive future.⁴ A climate-smart ocean is shaped and driven by science-based action to help deliver ocean-climate solutions, including: significantly accelerating the transition of maritime transport — the backbone of global trade — towards zero emissions by 2050; allocating space for offshore renewable energy development; advancing low-carbon sustainable aquatic food systems; and climate change adaptation and resilience-building for ocean-economy activities and coastal infrastructure.

Ocean nature-based solutions can address the twin crises of biodiversity and climate change. Through restoring rich, biodiverse blue carbon ecosystems — including mangroves, seagrass, salt marshes and seaweed — and protecting critical marine environments, the climate change mitigation potential of ocean ecosystem-based approaches can be leveraged to address both crises, in turn, leading to more abundant oceans and supporting resilient coastal communities (Hoegh-Guldberg et al., 2019).

A climate-smart ocean approach has impacts for the entire Sustainable Development Agenda — from providing energy and food security and contributing to better health and wellbeing (SDGs 2 and 3) and livelihoods (SDGs 1, 8 and 10) to enabling global trade (SDGs 9 and 14). A sustainable ocean economy also presents a major economic imperative — and opportunity, with the asset value of the ocean estimated at US\$ 24 trillion (WWF, 2015). Importantly, the ocean is a vital provider of food, nutrition and livelihoods for many Small Island Developing States (SIDS) and Least Developed Countries (LDCs) (UNCTAD, 2021).

2. Illustrated by the recent UNFCCC Ocean Dialogues 2020; the 'Blue' COP25 in 2019; mandated ocean works of the UNFCCC's Nairobi Work Programme in 2019; and the inclusion of SDG 14 in the 2030 Agenda for Sustainable Development. See BOX 2 for an overview.

3. In this context, equity is defined as a concern for both equal and fair treatment (Österblom, et al., 2020, p.4)

4. The targets of the Nature Positive framework described by Locke et al. (2021) call for an immediate halt in the decline of nature, measured from a baseline of 2020, and then reversing "nature loss" by 2030, with "full recovery" by 2050 (Earth Commission, 2021).

SIX KEY STEPS TO UNLOCK A CLIMATE-SMART OCEAN

1. INCLUDE THE OCEAN-CLIMATE NEXUS IN POLITICAL AND PUBLIC PROCESSES

Parties at COP 26 can mainstream ocean-based mitigation and adaptation measures in Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). Stakeholders can use COP 26 to raise political recognition for the ocean-climate nexus, setting a strong precedent for inclusion in other vital international processes — including the forthcoming Post-2020 Global Biodiversity Framework, the UN Food Systems Summit and the UN Ocean Conference — as well as the implementation of measures as part of the International Maritime Organization's (IMO) Initial GHG Strategy (2018). Marine spatial planning (MSP) processes can be enhanced using a climate-smart approach, which seeks to foster resilience in the context of a changing climate by mainstreaming mitigation and adaptation into planning. This approach makes optimal use of climate-proofed area-based management tools (AMBTs), including well-designed Marine Protected Areas (MPAs), and minimizes conflicts while enabling synergies between marine users.

2. ENCOURAGE PRIVATE SECTOR INNOVATION IN OCEAN MANAGEMENT

The private sector has a vital responsibility to contribute to the rapid transformation to a net-zero, equitable and climate-resilient ocean economy and can scale up climate solutions. While sectors such as fisheries and maritime transport are facing vital mitigation challenges to rapidly decarbonize, other ocean industries, such as offshore renewable energy and aquaculture including seaweed cultivation are competing for access to an already crowded marine space (Crona et al., 2021).

The opportunities presented by these transforming sectors can likewise spur blue innovation focused on optimizing the multi-use of marine spaces. Moreover, spatial challenges coupled with the nature crisis are leading to new awareness in the importance and value of ocean biodiversity, including incorporating nature inclusive designs that reflect coexistence values, regenerative aquaculture methods, and striving for net biodiversity gains.

5. A recent example of this is the US 'Climate-Smart Port Act' which puts environmental justice and green job creation at the centre of its green ports policy (Barragan, 2021).

3. ADVANCE AND STRENGTHEN CLIMATE-SMART OCEAN BUSINESS OPERATIONS

Ocean-based industries — such as maritime transport, aquaculture and fisheries — are taking mitigation action by setting science-based targets (SBT) aligned with a 1.5°C trajectory across their value chains. While the business case for SBTs is increasingly established, forward-thinking corporate leadership is still often required in the absence of clear decarbonization pathways. Defining a long-term, net-zero pathway can be supported by interim target-setting and leveraging cross-sectoral value chain collaboration. Advances in scientific understanding of the role of blue carbon ecosystems have helped articulate the business case for mitigation measures beyond value chain reduction targets. Likewise, the financial and insurance sectors are increasingly aware of the risks associated with undermining the functioning of ocean ecosystems that act as natural buffers to climate change. However, despite the urgent need for accelerated action, wide-scale progress on adaptation measures and resilience-building continues to move at a slow pace.

4. ADOPT A HUMAN-CENTRED APPROACH TO POLICY AND OPERATIONS

The current ocean economy is characterized by inequity and inequality (Österblom et al., 2020). Moreover, climate change threatens the effective enjoyment of a range of human rights, particularly those in vulnerable situations (OHCHR, 2021), and will disproportionately affect people in LDCs and SIDS (Blasiak et al., 2017). Climate-smart policies and operations should therefore address environmental and climate injustices,⁵ and be consistent with international standards to respect human rights, including the [UN Guiding Principles on Business and Human Rights](#). The transition to a net-zero ocean economy is also an opportunity to create decent, fair, and safe new green jobs — including those arising from the offshore renewable energy sector and the wider decarbonization of the maritime industry.

The transition must be just and leave no one behind, ensuring the inclusion of smallholders, the protection of workers in declining industries, and accessible skills development training and knowledge-transfer. Inclusive engagement with local communities and diverse stakeholders should be embedded in ocean-climate action, such as in community-led nature-based solution projects, e.g. blue carbon projects. Indigenous peoples and local communities must be consulted with from the earliest stages of political processes in contexts ranging from the international (e.g. UNFCCC) to the regional and national (e.g. MSP).

5. HARNESS BLUE FINANCE

Both private and public finance are key enablers for ocean-climate action. However, current investments in climate and nature fall well below what is needed to achieve the 2030 Agenda. It is vital to close the climate-nature investment gap and by doing so, ensure that climate investment includes ocean investment, thereby increasing investor understanding of the opportunities provided by the ocean. Investor appetite is nonetheless growing for blue financial solutions to solve sustainability challenges. Public, private and blended finance are key enablers for the development of ocean management plans and resilient coastal infrastructure, particularly in developing countries. Leveraging private finance, for instance through Blue Bonds, will be essential to support and reward ambitious corporate action as well as create a market demand for sustainability (UN Global Compact, 2020b; UNEP FI, 2021).

6. PRIORITIZE INDUSTRY-POLICY-SCIENCE COLLABORATION ON DATA COLLECTION, SHARING AND MANAGEMENT

Robust science and innovation are at the core of advancing ocean-climate solutions, including by addressing engineering challenges and resolving conflicts and uncertainties surrounding the impacts of siting certain technologies on marine environments. Increased sharing of data non-confidential data is essential. Climate-smart ocean business also requires collective data management to facilitate risk-assessment and improve performance, reliability, and durability as well as to monitor maritime infrastructure and marine ecosystems. More inclusive approaches to data management across value chains and multi-use approaches will enhance the development of long-term solutions and adaptive planning techniques. The UN Decade of Ocean Science for Sustainable Development (2021–2030)⁶ represents a unique opportunity to drive science-based engagement with companies operating in the ocean (UN Global Compact, 2020d).



6. For further information, please see: <https://www.oceandecade.org/>

TABLE 1: OVERVIEW OF ACTIONS FOR DECISION-MAKERS

ACTOR	STEP	ACTION
Parties	1. Include the Ocean-Climate Nexus in Political and Public Processes	<ol style="list-style-type: none"> 1. Continue to amplify the recognition of the Ocean within the UNFCCC process and COP 26 outcomes through strengthening ocean-related mitigation and adaptation measures in NDCs/NAPs 2. Harness the decisions of COP 26 (UNFCCC) and COP 15 (UN Biodiversity Convention) to address the nexus of ocean, climate and nature 3. Use COP 26 to raise climate ambition of IMO Member States and align international shipping with the Paris Agreement's 1.5°C temperature target 4. Bridge climate, food security and nutritional needs through amplifying aquatic food systems in the UN Food Systems Summit and COP 26 5. Enhance Marine Spatial Planning processes to harness the ocean-climate nexus
Parties and Business Leaders	2. Encourage Private Sector Innovation in Ocean Management	<ol style="list-style-type: none"> 1. Advance ocean multi-use innovation and partnerships between marine users 2. Incorporate and implement restorative, regenerative and nature inclusive approaches to bridge climate with biodiversity 3. Enable responsible private sector engagement in ocean planning e.g. an MSP process
Parties and Business Leaders	3. Advance and strengthen Climate-Smart Ocean Business Operations	<ol style="list-style-type: none"> 1. Urgently set bold mitigation measures aligned with the 1.5°C target 2. Broaden business mitigation efforts beyond the value chain to include actions taken to restore blue carbon ecosystems 3. Increase the Sustainable Ocean Business Case for resilience, and urgently scale-up risk-assessments and adaptation action
Parties and Business Leaders	4. Adopt a Human-Centred Approach to Policy and Operations	<ol style="list-style-type: none"> 1. Integrate environmental justice and human rights considerations in political decision-making processes on the international and national level 2. Incorporate a community lens for climate and societal co-benefits 3. Ensure a 'just transition' for all to a climate-smart ocean economy
Parties, Business Leaders and Financial Actors	5. Harness Blue Finance	<ol style="list-style-type: none"> 1. Close the climate-nature investment gap while ensuring climate investment includes ocean investment 2. Create a market pull for climate-smart ocean business through mechanisms, such as Blue Bonds, as well as mainstream sustainability-related requirements for financing 3. Invest in ocean management, knowledge generation, and blue infrastructure through harnessing private, public and blended financial mechanisms
Parties and Business Leaders	6. Prioritize Industry-Policy-Science Collaboration, Sharing on Data Collection, Sharing and Management	<ol style="list-style-type: none"> 1. Improve sharing and collective data management for climate-smart ocean business 2. Accelerate robust scientific research to enhance and improve the development of ocean-climate solutions on mitigation and adaptation 3. Work towards data-driven MSP processes 4. Advance ocean literacy across all communities

INTRODUCTION

WE ARE IN A CLIMATE AND NATURE EMERGENCY

Climate change is an existential threat to human life, prosperity and societies. From droughts, wildfires and extended heatwaves to severe and fatal flooding, the threats to human well-being from climate change are now recognized to be more severe than previously predicted 20 years ago. People and many vulnerable communities around the world, often those least responsible for emissions, are already facing existential threats from climate change-related impacts. Global emissions need to be cut drastically and without delay to avoid the most devastating effects of climate change and limit warming to 1.5°C ([IPCC, Special Report on 1.5 degrees, 2018](#); [IPCC, 2021](#)).

Even with these stark and dire warnings, based on our current trajectory, levels of planet-warming greenhouse gas emissions will have barely moved by 2030 ([UNFCCC, 2021](#)). According to the latest UN Environment Programme (UNEP) Emissions Gap Report ([2020](#)), despite a brief dip in carbon dioxide emissions caused by the COVID-19 pandemic, the world is still heading towards a temperature rise in excess of 3°C this century — far beyond the Paris Agreement goals of limiting global warming to well below 2°C and pursuing 1.5°C. The recent road map by the International Energy Agency ([2021](#)) underlines that the opportunity to achieve net-zero emissions by 2050 is still achievable, but there is narrow window of opportunity. We must rapidly and urgently cut our greenhouse gas (GHG) emissions across the global economy to get to zero emissions as quickly as possible.

The climate emergency is not the only planetary crisis we are facing: nature loss is accelerating at an unprecedented rate with nearly 1 million species at risk of extinction from human activities ([Dasgupta, 2021](#)). It is imperative that we address both crises urgently and holistically, especially in view of their interconnected nature and the resultant cumulative and cascading impacts such as aggravating food insecurity and malnutrition ([FAO, IFAD, UNICEF, WFP and WHO, 2021](#)). Indeed, a landmark report recently issued by the IPCC and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) calls for an urgent, interconnected approach to both climate and nature ([Pörtner et al., 2021](#)). COP 26 and COP 15 present important opportunities to advance climate and biodiversity action synergistically.

THE OCEAN CAN BE A SOLUTION

The ocean has been disproportionately affected by global warming having absorbed more than 90 per cent of the extra heat stored in the earth's atmosphere from increased GHG emissions ([Zanna et al., 2018](#)). Increased ocean warming and acidification has also led to changes in marine ecosystem patterns with serious impacts on species richness and distribution ([UNFCCC, 2021, p. 9](#)), bringing significant social and economic consequences — especially for those countries and communities most dependent on the ocean for food security, nutrition and livelihoods ([Barange et al., 2018](#)).

Until recently, the ocean has been largely absent from global policy conversations on climate change (see **BOX 2**) despite the fact the ocean hosts a wealth of solutions to mitigate climate change and enhance adaptation and resilience (see **BOX 1**).⁷ Moreover, the restoration and rehabilitation of coastal ecosystems can both recover ecosystem biodiversity and functionality while helping sequester carbon ([Pörtner et al., 2021](#); [WWF, 2021](#)), combatting both the nature and climate crises.

7. The High Level Panel for Sustainable Ocean Economy quantifies the mitigation potential of several ocean-based climate solutions, putting the potential of reducing the gap emission through ocean-based climate solutions at 21 per cent to keep temperature rise to 1.5°C by 2050 ([Hoegh-Guldberg et al., 2019](#)).

BOX 1**OVERVIEW OF FIVE OCEAN-CLIMATE MITIGATION AND ADAPTATION SOLUTIONS****OCEAN NATURE-BASED SOLUTIONS**

Ocean nature-based solutions provide a vital opportunity to reconcile biodiversity and climate, including mitigation, adaptation and resilience goals.⁸ Protecting and restoring three coastal blue carbon ecosystems globally (seagrass, tidal marshes and mangroves) could reduce emissions by as much as 1.4 billion tons of carbon dioxide equivalent annually by 2050 (Hoegh-Guldberg et al., 2019). In addition, seaweed cultivation is one of the most scalable and promising ocean solutions. Seaweed-derived products can play a significant role in decarbonizing the economy and sequestering carbon (Cai et al., 2021), while offering significant benefits for developing nations (UN Global Compact, 2021b). Ocean ecosystems are also integral to coastal and social resilience, contributing to climate change adaptation objectives through acting as cost-effective seawalls combatting coastal flooding and shoreline disintegration (UNEP, 2020) and providing numerous ecosystem services and opportunities for livelihood transition.⁹

SUSTAINABLE SEAFOOD

Food from the ocean is vital to nourish a growing global population. It is a vital contributor to food security due to its high nutrition content and growth potential (Costello et al., 2020). Fish derived from sustainably managed fisheries and aquaculture is known to have one of the lowest carbon footprints among all animal-based commodities (Barange et al., 2018), and seafood provides more than 3.3 billion people with at least 20 per cent of their average per capita intake of animal protein (FAO, 2020). Globally, emissions of GHG by fisheries and aquaculture were estimated at around 7 per cent of those from agriculture, mainly from fishing vessels (about 0.5 per cent of total global CO₂ emissions in 2012). Small-scale fisheries likely provide nearly half the world's seafood, playing a critical role in food security and nutrition, particularly in coastal communities in low-income, food-deficit countries (Hicks, 2019).

OFFSHORE RENEWABLE ENERGY (ORE)

ORE will play an important role in the future clean energy mix (Hoegh-Guldberg et al., 2019). Potential growth for offshore wind energy production alone is enormous (GWEC, 2021). Emerging ORE sources such as offshore solar, wave, tide and thermal energy provide reliable and flexible energy for coastal countries. Upscaling capacity for energy efficiency and renewable energy generation may bring major co-benefits in terms of both climate change mitigation and adaptation but also in terms of reduced dependency on energy imports and related expenditure. This is particularly critical for countries that are facing long-term supply chain disruptions. Strategic-level planning and risk screening are key to ensure that ORE developments are not placed in areas of high sensitivity for biodiversity.

ZERO-CARBON SHIPPING

Maritime transport plays a crucial role enabling international trade and facilitating economic development globally. Although it is one of the most energy efficient modes of transport, shipping accounts for approximately 3 per cent of global GHG emissions (IMO, 2020) and emits around 15 per cent of some of the world's major air pollutants annually. Technological advancements to decarbonize marine transport are progressing but must be brought to scale, in turn, ensuring connectivity and supporting economic growth.¹⁰

CLIMATE-RESILIENT PORTS

Seaports are essential for global trade-led development. They provide access to global markets and supply chains for all countries and are integral to maritime transport as well as many economic activities in coastal zones like fisheries. At the same time, ports are exposed to various climate-related risks, including heat waves, extreme winds and precipitation, with mean sea level rise (SLR) and associated extreme sea levels (ESLs) posing a particularly important, and growing threat (IPCC, 2019). Given the critical role of ports in the global trading system and their potential exposure to climate-related damage, disruptions and delays, enhancing their climate resilience is a matter of strategic socio-economic importance.

8. Ocean-nature based solutions should follow the [IUCN Global Standards](#) definition.

9. For instance, seaweed farming provides opportunities for livelihood transition, notably for commercial fishers who are facing occupational insecurity as fishstocks are depleted.

10. The World Bank has estimated that decarbonizing shipping presents a \$1+ trillion opportunity ([World Bank, 2021](#)).

The ocean-based economy also plays a vital role in delivering on all 17 of the SDGs. The overall value of key ocean assets has been estimated to be at least \$24 trillion (WWF, 2015) while the value of ocean-based tradable goods and services has been estimated to be at least \$2.5 trillion (UNCTAD, 2021). Existing estimates may not fully take into account all sectors and activities and not all of the socio-economic benefits are readily quantifiable. In addition to SDG 13: Climate Action, the ocean plays a fundamental role in SDG 2 and 3 by supplying the global population with nutritious food and making a significant contribution to food security and nutrition. Alongside sectors such as fishing, aquaculture and maritime transport — vital for global trade and access to global markets which are key to progress on SDG 9 and 14 — the tourism sector also provides a key area of decent work in many parts of the world, supporting SDG 8. Critically, a sustainable ocean economy is a vital provider of livelihoods for many coastal states, SIDS and LDCs, a matter highlighted in SDG 14.¹¹

WE NEED TO UNLOCK A 'CLIMATE-SMART' OCEAN

To unlock the full potential of ocean-based solutions, we need a climate-smart approach to the ocean. A 'climate-smart' ocean is one that has fulfilled its maximum potential to address both the climate and nature crises as well as the broader 2030 Agenda for Sustainable Development. It is part of a net-zero, resilient, equitable and nature-positive system change. It is able to scale-up vitally needed resources — from offshore renewable energy to a sustainable aquatic food industry — through responsible and sustainable spatial management. It is able to protect the livelihoods of vulnerable coastal communities due to the enhancement of ocean-based adaptation measures and equitable access to resources and distribution of benefits. A climate-smart ocean has maintained or restored its blue carbon ecosystems. Widespread integrated, sustainable ocean management is able to balance the scaling-up of ocean-climate mitigation and adaptation solutions with protecting marine ecosystems through AMBTs. Nature and biodiversity loss can subsequently be reversed. A climate-smart ocean has a thriving, equitable sustainable ocean economy, continuing to provide livelihoods for billions of people around the world as well as food security for a growing population.

11. See SDG 14.7: "By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism".

BOX 2**THE OCEAN-CLIMATE NEXUS IS STEADILY GAINING POLITICAL RECOGNITION**

RECENT EXAMPLES OF THE OCEAN-CLIMATE NEXUS IN POLITICAL PROCESSES

- The inclusion of SDG 14 in the 2030 Agenda for Sustainable Development
- The initiation of the 'Ocean and Climate Dialogue' under the auspices of the UNFCCC
- The 'Blue' COP 25 in Madrid
- Launch of the High Level Panel for a Sustainable Ocean Economy under the leadership of 14 Heads of State
- The [UNFCCC Marrakech Partnership Global Climate Action Pathways](#), launched in 2019 and revised in 2020 and 2021
- Increasing number of ocean-climate measures in countries' Nationally Determined Contributions (NDCs)
 - Ocean nature-based solutions ([Lecerf et al., 2021](#))
- Recent high-level events convening world leaders
 - Ocean-Climate Ambition Summit in January
 - UN Global Compact Catalyzing the Ocean-Climate Ambition Loop towards [COP 26](#)
- A number of recent reports on the Ocean-Climate Nexus

BOX 3**ADVANCING A CLIMATE-SMART OCEAN THROUGH THE UN OCEAN DECADE**

In December 2020, the Member States of the United Nations re-stated their support for the UN Decade of Ocean Science for Sustainable Development. With a vision of 'the science we need for the ocean we want', the Ocean Decade recognizes the importance of transformative, inclusive, solutions-oriented science to underpin the achievement of a sustainable ocean economy and a sustainably managed ocean. The Ocean Decade provides a framework for diverse actors — including business and industry — to come together and generate and use improved ocean knowledge to fulfil 10 diverse but interrelated Ocean Decade Challenges ([UN Global Compact and IOC-UNESCO, 2020](#)).

Throughout the Decade, diverse groups of industry, science, non-governmental organizations, Government and community stakeholders will co-design and co-deliver Decade Actions. The knowledge generated through these Ocean Decade Actions will provide timely and highly relevant contributions to numerous aspects of this Blueprint.

The Ocean Decade Implementation Plan highlights the role of the Decade in contributing to policy, innovation and management solutions related to renewable energy, blue foods, nature-based solutions for increased climate resilience, sustainable ocean planning and blue carbon — all of which are central issues to this Blueprint.

BLUEPRINT FOR A CLIMATE-SMART OCEAN TO MEET 1.5°C

1. INCLUDE THE OCEAN-CLIMATE NEXUS IN POLITICAL AND PUBLIC PROCESSES

I. Continue to amplify the recognition of the ocean within the UNFCCC process and COP 26 outcomes through strengthening ocean-related mitigation and adaptation measures in NDCs/NAPs

The activities under the UNFCCC and the Paris Agreement set out operational mechanisms for countries to plan and implement adaptation and mitigation efforts, including Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). It is key that these activities on adaptation and mitigation fully integrate ocean-climate measures. This includes mitigation measures such as incorporating targets for scaling up offshore renewable energy, promoting low-carbon food production from sustainable fisheries and aquaculture as well as supporting work being done to decarbonize the maritime sector.

Both NDCs and NAPs can strive towards incorporating the value of ocean nature-based solutions, such as seaweed, salt marshes, mangroves and seagrass, which contribute both to mitigation and coastal resilience.

Climate change adaptation and resilience-building for ports and other critical coastal infrastructure is also becoming increasingly important and can be embedded by Parties into NAPs. Successful adaptation strategies will need to be underpinned by strong legal and regulatory frameworks that can help to reduce exposure and/or vulnerability to climate-related risks of coastal infrastructure ([UNCTAD, 2020c](#)). Appropriate strategies,¹² policies and standards¹³ also have an important role to play.

Ocean nature-based solutions, such as seaweed restoration and farming, present important opportunities for carbon removal (UN Global Compact, 2021b). Between 100–1000 gigatons of carbon removal will be required — in addition to reducing human-made GHG emissions — by the end of the century to meet the 1.5°C target with limited or no overshoot ([IPCC, 2018](#)). Even under the most optimistic emissions reduction scenarios, without carbon removal, there will be substantial risks, notably for food security, heat exposure, coastal flooding and biodiversity loss ([IPCC, 2018, figure SPM.3](#)). It is imperative to note that any ocean nature-based carbon removal solution should be in addition to — not a substitute to — a rapid phase-out of high-emission activities.

RECOMMENDATIONS TO PARTIES

1. **Recognize** that climate action is ocean action ([UNFCCC, 2021a](#))
2. **Strengthen** ocean-related mitigation and adaptation measures in NDCs and NAPs
3. **Ensure** ocean nature-based solutions are not used as a substitute for a rapid phase-out of high-emission activities

12. See for instance the [2021 EU Climate Change Adaptation Strategy](#).

13. See ISO 14090:2019 Adaptation to climate change — Principles, requirements and guidelines; [ISO 14091:2021 - Adaptation to climate change-Guidelines](#) on vulnerability, impacts and risk assessment.

BOX 4**OVERVIEW OF OCEAN-RELATED MITIGATION AND ADAPTATION MEASURES FOR NDCS AND NAPS**¹⁴

- Increase recognition of offshore renewable energy production in coastal states NDCs
 - Include emission reductions from scaling up offshore renewable energy production in nationwide GHG targets
- Mainstream aquatic food systems in NDCs and NAPs
 - Include adaptation and mitigation targets for fisheries and aquaculture and prioritize measures and indicators to track progress towards achieving such targets
 - Commit to strengthening national policies to incentivize transformation to inclusive, sustainable and resilient aquatic food systems
- Include trade on sustainable and low-carbon ocean-based good and services in NDCs, NAPs and in Oceans Economy and Trade Strategies ([UNCTAD-DOALOS, 2021a](#))
- Include domestic shipping in NDCs
 - Expand and increase the ambition of existing economy-wide GHG targets by including emissions reductions from domestic marine transport
- Develop specific energy and technology transition plans as a follow-up of NDCs which include investments enabling zero-emission shipping
- Include ocean nature-based solutions for mitigation and adaptation, especially blue carbon ecosystems, in both NDCs and NAPs
 - Include the restoration of degraded kelp forests, establishment of new kelp forests and the expansion of seaweed cultivation ([UN Global Compact, 2021b](#))
 - Commit to improved management and restoration, when necessary, of blue carbon ecosystems
- Include enhancing and protecting vital coastal infrastructure, such as ports, in NAPs ([Asariotis, 2021](#))
- Phase out fuel subsidies and fuel tax exemptions for transport and fishing fleets ([Vivas Eugui, 2020](#); [Vivas Eugui and Contreras, 2020](#))

II. Harness the decisions of COP 26 (UNFCCC) and COP 15 (UN Biodiversity Convention) to address the nexus of ocean, climate and nature

COP 26 (UNFCCC) and the upcoming COP 15 (UN Biodiversity Convention) have been recognized as opportunities to address climate change and biodiversity loss holistically ([Pörtner et al., 2021](#)). The Goals of the Post-2020 Global Biodiversity Framework directly speak to the interlinked nature of biodiversity and climate while Target 8 of the Post-2020 Framework connects climate change with biodiversity by referencing the mitigation

and adaptation potential of ecosystem-based approaches ([CBD, 2021](#)).¹⁵ However, there is additional scope to ensure further synergies are leveraged between climate mitigation, adaptation and biodiversity. Parties can work to ensure coherence and synergies across the commitments and targets set in the CBD and UNFCCC processes which is critical to prevent fragmentation and implement solutions in a cost-effective way. This includes strengthening the role of ocean nature-based solutions in the upcoming COP 15 and COP 26. Ocean nature-based solutions provide a vital opportunity to reconcile biodiversity and climate, including adaptation, resilience and mitigation goals.

14. See Northorp et al. (2020) for a comprehensive overview of how ocean-climate solutions can be incorporated into NDCs.

15. Target 8 in the First Draft: "Minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 GtCO₂e per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity" ([CBD, 2021, p. 4](#)).

RECOMMENDATIONS TO PARTIES

- 1. Leverage** the COP 26 Presidency's focus on nature-based solutions to raise awareness for synergies between the climate and biodiversity agenda
- 2. Ensure** coherence and synergies across the commitments and targets set in the CBD and UNFCCC processes
- 3. Recognize and leverage** the synergies among carbon mitigation, adaptation and biodiversity in ocean-based climate-nature solutions, including in the Post-2020 Global Biodiversity Framework
- 4. Design** ocean nature-based solutions in a way that provides benefits both for climate change mitigation and adaptation and for biodiversity

III. Use COP 26 to raise climate ambition of IMO Member States and align international shipping with the Paris Agreement's 1.5°C temperature target

There remains some misalignment between the position of certain Member States of the International Maritime Organization (IMO) and their commitments under the terms of the Paris Agreement. Under the IMO's Initial GHG Strategy (2018), the total annual GHG emissions from international shipping should be reduced by at least 50 per cent by 2050 compared to 2008. It is key that IMO Member States align the international shipping industry with the Paris Agreement's 1.5°C temperature goal by adopting a target of full decarbonization of international shipping by 2050 at the very latest when the strategy is to be revised in 2023.

This would align the ambitions of many IMO delegations with their Governments who actively support bringing their policies in line with the Paris Agreement, thereby countering the current disconnect between IMO Member States' positions at the IMO and their pledges in national climate and energy plans.

The transition to zero-emission shipping in line with 1.5°C must also go hand in hand with sustainable and equitable socio-economic growth. At present, the price and competitiveness gap between proposed zero-carbon fuels and fossil fuels is vast. Developing countries need equitable access to opportunities presented by accelerated decarbonization, such as those presented by the uptake of new low- to zero-carbon fuel sources. The IMO plays a key role in this context to ensure a level playing field.

THE KEY RECOMMENDATIONS FROM THE UN GLOBAL COMPACT, 2021C TO PARTIES ARE:

- 1. Target** as soon as possible IMO Member States must support revision of the GHG Strategy to align with the Paris Agreement's 1.5°C temperature target
- 2. Ensure** low-carbon pledges in national climate and energy plans are reflected in positions in the IMO
- 3. The IMO** must work towards ensuring that the alignment of shipping with 1.5°C is equitable through introducing meaningful a market-based measure

IV. Bridge climate, food security and nutritional needs through amplifying aquatic food systems in the UN Food Systems Summit and COP 26

The [2019 EAT-Lancet report](#) underlines the need to shift current paradigms on health and sustainability to include the environmental element, labelling current food systems as this century's "greatest health and environmental challenge". Aquatic food plays a unique role in this context. The fisheries and aquaculture sector makes significant contributions to food and nutrition security and is expected to contribute a bigger portion to future food baskets ([FAO, 2020](#); [UN Nutrition, 2021](#)) — especially in low income

countries — as well as offer a more carbon-efficient and sustainable sources of animal protein and micronutrients than land-based meat production ([Barange et al., 2018](#)). Therefore, fisheries and aquaculture form a key element of sustainable food system policy ([Tlusty et al., 2019](#); [UN Global Compact, 2021e](#)).

The UN Food System Summit and COP 26 represent important opportunities to holistically bridge policymaking with dietary needs and climate-friendly food production and raise awareness for the role of aquatic food.

RECOMMENDATIONS TO PARTIES

- 1. Strengthen** the mutual mainstreaming between aquatic food systems and environmental sustainability considerations in relevant agendas, strategies, policies and budgets at international, national and local levels
- 2. Include** climate adaptation and resilience-building measures in multispecies fish management plans ([UNCTAD-DOALOS, 2021b](#))
- 3. Set up** cross-governmental food system task forces to enable holistic, coordinated and cross-ministerial policymaking to advance sustainable food systems ([UN Global Compact, 2021e](#))

V. Enhance Marine Spatial Planning Processes to Harness the Ocean-Climate Nexus

The ocean hosts a wealth of ocean-climate solutions; however, the demand for ocean space is rising with a combination of both new and established users, from fishing, tourism, national defence and shipping to offshore renewables and new forms of aquaculture. More users will undoubtedly emerge over the coming years, including biotechnology and deep-water thermal applications. In order for ocean-climate action to thrive, sustainable ocean management will be essential, as has been recognized by the High Level Panel for a Sustainable Ocean Economy (forthcoming – Hanson et al., 2021).¹⁶ Marine Spatial Planning (MSP) has emerged over the last two decades into a streamlined, multi-stakeholder, public, inclusive and participatory process. Using an evidence-based approach, MSP improves coordination among marine stakeholders while minimizing cross-sector conflicts and tapping into synergies (UN Global Compact, 2021a). By 2030, IOC-UNESCO estimates that, through international support and knowledge exchange between multiple initiatives, 30 per cent of the world's maritime areas under national jurisdictions will have a marine spatial plan ([2017](#)).¹⁷

However, there is growing urgency to adopt a more climate-smart approach to MSP ([UNESCO-IOC, 2021](#)). Moving towards a climate-smart MSP process would foresee space for climate mitigation solutions and take into account how climate change might affect the marine environment, and subsequently planning, leading to increased ocean-based climate adaptation (UN Global Compact, 2021a). A climate-smart MSP process has the potential to reconcile the decarbonization and biodiversity agendas. It is subsequently vital that a MSP process has a Strategic Environmental Assessment (SEA). A SEA can, for instance, be used to consider different planning scenarios to assess impacts. Adopting a climate-smart approach would also allow for meeting spatial designation objectives for mitigation measures, such as clean energy, and other effective area-based conservation measures (OECMs), vital tools for restoring ocean biodiversity, fish stocks and ecosystem services ([Gurney et al., 2021](#)). Moreover, adopting a transboundary approach which considers ecological connectivity across borders will be essential to deliver on biodiversity targets.

16. As noted by the High Level Ocean Panel for a Sustainable Ocean Economy, ocean management "provides a framework to reconcile conflicting uses of the ocean and its resources and enable long-term sustainable growth in the ocean economy" ([2020, p. 4](#)).

17. This is also reflected in the 2030 Agenda for Sustainable Development which calls for a "proportion of national exclusive economic zones managed using ecosystem-based approaches" ([SDG indicator 14.2.1](#)).

RECOMMENDATIONS TO PARTIES

- 1. Commit** to sustainably managed oceans by 2025, as proposed by the High Level Panel for a Sustainable Ocean Economy ([High Level Panel, 2020](#))
- 2. Encourage** a MSP process through a coordinated and inclusive approach engaging diverse stakeholders, learning from best practices and existing MSP processes¹⁸
- 3. Incorporate** a climate-smart approach to the MSP process to enable the development of ocean-climate solutions, ensuring incorporation of adaptation and mitigation measures
- 4. Strengthen** cross-border and transnational collaboration mechanisms on MSP, such as the establishment of regional cooperative mechanisms to assess cumulative impacts, or establish common monitoring frameworks across basins (UN Global Compact, 2021a)
- 5. Use climate-smart MSP** to identify priority areas for marine protection and other effective area-based conservation measures to support climate and biodiversity, thereby supporting the global target in the Post-2020 Global Biodiversity Framework to protect 30 per cent of the ocean by 2030

18. For example, the European Union MSP Platform has several case studies and best practices. The MSP Global Initiative website also has a number of guidance documents and best practices (<https://www.mspglobal2030.org/>).

2. ENCOURAGE PRIVATE SECTOR INNOVATION IN OCEAN MANAGEMENT

I. Advance ocean multi-use innovation and partnerships between marine users

Spatial challenges are leading to new approaches in co-existence between marine users and catalyzing innovation. The multi-use concept has been identified as a significant opportunity to better integrate new ocean users, such as offshore renewable energy, into the existing context of other uses, such as the tourism industry (Schupp et al., 2019; UN Global Compact, 2021a).

Offshore renewable projects are also being combined with aquaculture to support the movement of aquaculture installations further offshore (ibid.).¹⁹ Exploring co-existence and multi-use innovation requires strong partnerships between marine resources users to build a basis of trust. Strong partnerships can also look beyond multi-use and explore other benefit-sharing programmes as well as consider dedicated industry liaisons (e.g. between the offshore renewable energy sector and the fishing industry).

RECOMMENDATIONS TO PARTIES

1. **Identify** suitable test sites for implementing blue technologies and co-existence approaches, either through an MSP process or through other permitting procedures (e.g. Environmental Impact Assessments (EIA))
2. **Explore** novel, socially innovative and inclusive stakeholder fora as a way to enable marine users to come together and discuss ways to maximize synergies (e.g. a Community of Practice)²⁰

RECOMMENDATIONS TO BUSINESS LEADERS

1. **Innovate** and catalyze blue synergistic solutions including multi-use solutions, such as combining offshore renewable energy with aquaculture or tourism
2. **Build** strong partnerships with other ocean users and ocean sectors

II. Incorporate and implement restorative and nature inclusive approaches to bridge climate with biodiversity

Co-existing with and restoring natural ecosystems should form an integral part of sustainable ocean business. Although there are biodiversity impacts across the phases of developing offshore renewable energy projects (e.g. bird collision with turbines), many of these can be mitigated at the impact assessment stage and through a careful layout and design process and early identification of risks through screening (IUCN, 2021).

Careful siting and design of offshore renewable energy structure can not only mitigate impacts but also create opportunities for conservation and enhancement of marine biodiversity (ICF, 2020). For example, the artificial reef effect, whereby offshore installations offer new habitats for colonization, can diversify and grow the local flora and fauna (ICF, 2020). Offshore renewable energy structures are also increasingly being developed with a nature-inclusive design (UN Global Compact, 2021a). More recently, offshore renewable energy companies have also announced net-positive biodiversity impact goals.²¹

19. For example, two European Union-backed Dutch companies have created the first offshore solar and seaweed farm in the North Sea (EU MSP Platform, 2021).

20. Ongoing discussion fora (i.e. Community of Practice) are being increasingly established, such as the recently launched 'Blue Forum' by the European Commission or the MSP Civil Society Forum under South Africa's Blue Economy Strategy. Noting that good practices of Community of Practice already exist in the Netherlands and the United States.

21. For example, offshore renewable energy company Ørsted has set a goal to deliver a net-positive biodiversity impact from all new renewable energy projects that are commissioned from 2030 at the latest (2021).

Aquaculture — including seaweed industries — can further contribute to restoring ocean ecosystems while ensuring food security. Restorative and regenerative aquaculture, such as Integrated Multi-Trophic Aquaculture (IMTA), can improve the health of the waters, lands and animals to become more resilient to changing environmental conditions. IMTA involves the farming of aquaculture species from different trophic levels with complementary ecosystem functions. This approach integrates seaweed, fish and shellfish and enables by-products and uneaten

food waste to be recaptured and converted, for instance as feed, harnessing interactions between species ([Chopin, 2021](#)). By embracing native species and keeping production systems diverse, IMTA allows farm operators to follow a more ecologically sound approach and enhances adaptive capacity and resilience to risks, such as climate change and diseases. The cultivation of bivalve shellfish and seaweed can deliver valuable ecosystem services, including provision of new habitats for fish and mobile invertebrate species ([Theuerkauf et al., 2021](#)).

RECOMMENDATIONS TO PARTIES

1. **Recognize** the potential for nature-positive outcomes provided by sustainable aquaculture and work towards creating public incentives to reward farmers for nature benefits
2. **Stipulate** nature enhancement within offshore wind farms, requiring permit holders to take measures to minimize impacts and increase the suitable habitat for naturally occurring species²²

RECOMMENDATIONS TO BUSINESS LEADERS

1. **Offshore renewable energy companies** can incorporate a nature-inclusive design (e.g. in the form of a smart offshore wind foundation or scour protection design serving as an artificial reef)²³
2. **The offshore renewable energy industry** can work collaborative towards identifying KPIs for overall positive outcomes for nature (e.g. a net positive biodiversity impact)
3. **Aquaculture companies** can implement restorative, regenerative and sustainable aquaculture methods, such as IMTA

III. Enable responsible private sector engagement in ocean planning e.g. MSP processes

The important role the private sector plays in spatial planning and integrated ocean management has been recognized ([Winther, Dai et al., 2020](#)). Establishing partnerships between public and private sectors and engaging relevant stakeholders through legitimate processes are success factors for a thriving sustainable ocean economy. Industry can also drive dialogues and new approaches to ocean management tools, such as a climate-smart MSP process.

For example, the offshore renewable energy industry can, in some cases, drive planning, including zoning designs, to ensure successful co-existence with other ocean users and help to craft a vision for future ocean management (UN Global Compact, 2021a). Effective private sector engagement must also follow an inclusive and participatory approach and involve all relevant stakeholders to encapsulate their needs and voices, especial smallholders and small and medium-sized enterprises (SMEs) who are often susceptible to marginalization in decision-making processes.

RECOMMENDATIONS TO BUSINESS LEADERS

Collaborate with Governments, non-governmental organizations and international organizations to support the implementation of ocean management processes, such as MSP

22. For example, the Dutch Government stimulates nature enhancement within offshore wind farms; currently, permit holders must take measures to increase the suitable habitat for species naturally occurring in the North Sea.

23. For further examples on nature-inclusive design options, please see the Wageningen University and Research [Nature-Inclusive Design Catalogue](#).

3. ADVANCE AND STRENGTHEN CLIMATE-SMART OCEAN BUSINESS OPERATIONS

I. Urgently set bold mitigation measures aligned with the 1.5°C target

Momentum for corporate emissions reduction is growing. Science-based targets are mitigation measures for the corporate sector to reach the Paris Agreement goals.²⁴ The increasing use of science-based target setting has the potential to move entire country indexes towards Paris Agreement alignment ([UN Global Compact, 2021f](#)). A number of ocean-based companies — in particular, from the offshore renewable energy sector — have joined the UN-led Race to Zero and set a science-based target to reduce their carbon footprint.²⁵

The maritime transport sector is taking action to decarbonize and needs to run on zero-carbon energy sources by 2050 (UN Global Compact, 2021c). This will require commercially viable zero-emission vessels operating along deep-sea trade routes by 2030 ([Getting to Zero Coalition](#)). The current lack of viable zero-carbon vessel technologies raises challenges for the maritime sector to set a science-based target and structure a GHG trajectory aligned with the 1.5°C target ([UNFCCC, 2021b](#)). Despite having a relatively low carbon footprint, there are significant opportunities for accelerating decarbonization along aquatic food value chains ([He et al., 2018](#)). Options to decrease emissions include technological efficiency, changing feed composition and reducing post-harvest fishing, among others ([Hoegh-Guldberg, 2019](#)).

Reductions of 10 to 30 per cent could be attained through the use of efficient engines and by improving vessel shapes ([UNCTAD, 2019b](#)). However, in the long term, while some larger fishing vessels face related technology uncertainties as the maritime transport sector, the diversity of fishing vessels renders a comprehensive approach to mitigation challenging. Both fisheries and aquaculture face challenges around Scope 3 emissions;²⁶ for example, sourcing low-carbon feed ingredients in aquaculture value chains (UN Global Compact, forthcoming 2022).

While current decarbonization pathways might be unclear in terms of future technologies and solutions around Scope 3 challenges, the urgency of the climate crisis requires ambitious private sector action and willingness to invest in the transition to zero emissions. Taking this bold leadership role can be supported by interim target setting and cross-sectoral collaboration. (see [BOX 5](#))

24. Targets are considered "science-based" if they are in line with what climate science deems necessary to meet the Paris Agreement goals and limit warming to 1.5°C.

25. As of 23 August, 35 offshore renewable energy companies are either committed or have set an approved SBT while nine seafood companies (aquaculture, feed and fisheries) are committed or have set a target. Seven shipping companies are committed with only one approved 1.5°C target. Please see <https://sciencebasedtargets.org/>.

26. Scope 3 includes all indirect emissions that occur in a company's value chain, often referred to as value chain emissions ([GHG Protocol Corporate Standard](#)).



BOX 5**INTERIM TARGET SETTING AND PRE-COMPETITIVE COLLABORATION HELP MITIGATION TARGETS****The importance of setting credible interim targets:**

Short, medium and long-term target setting can help to deliver the step change reductions required as well as signal a viable route to zero emissions to the market.

In the maritime transport sector, private sector efforts can focus on clear milestones from now to 2030, such as setting strategies which include a long-term fleet transition using the best pathway for a specific company profile (UN Global Compact, 2021c).

Leveraging the value chain and pre-competitive collaboration:

Cross-value chain partnerships are of huge relevance.²⁷ Working with suppliers to meet common challenges can help the private sector set emission reduction targets for Scope 3 emissions.²⁸ The broader shipping value chain also plays an important role in supporting the maritime industry's transition to net-zero. For example, through sending demand signals for green shipping, cargo owners can incentivize zero emissions in their entire logistical value chain ([Energy Transitions Commission, 2020](#)).

RECOMMENDATIONS TO PARTIES

- 1. Improve legislation**, policies and institutional arrangements to provide positive incentives for climate-friendly businesses and services, including subsidies, tax benefits, simplified permit processes and access to insurance
- 2. Implement** a global market-based measure to make zero-carbon shipping and fuel production commercially viable as well as equitable and accessible (UN Global Compact, 2021c)
- 3. Improve** public investment in innovation towards zero-carbon practices
 - Aquatic food system innovation includes increased investment in promoting sustainable aquaculture with zero-carbon practices and resilient species
 - In shipping, this could include (UN Global Compact, 2021c):
 - Investing in research and development (R&D) on how to diminish carbon, for instance through establishing pilot projects and national incubators
 - Incentivizing large-scale domestic production of zero-emission fuels
 - Creating incentives for zero-emission vessels through ports and port-to-port green corridors

RECOMMENDATIONS TO BUSINESS LEADERS

- 1. Establish** a science-based target aligned with 1.5°C with the Science-Based Targets initiative²⁹
- 2. Join** the UN-led Race to Zero
- 3. Engage** in pre-competitive collaboration and work with suppliers to reduce Scope 3 emissions

27. An example of this in the shipping industry is the Maersk Mc-Kinney Møller Center for Zero Carbon Shipping.

28. For example, working with suppliers to implement new feed raw materials in aquaculture value chains.

29. For further information on the Science-Based Targets initiative, please see <https://sciencebasedtargets.org/>.

II. Broaden business mitigation efforts beyond the value chain

Advances in scientific understanding of the role of blue carbon ecosystems acting not only as carbon sinks but also vital elements of resilient ocean ecosystems have helped articulate the business case for mitigation measures that extend beyond ambitious reduction targets to encompass actions to restore blue carbon ecosystems. As identified by the UNFCCC, ocean-based companies should begin to look beyond their own value chains to identify additional actions to enhance nature-based mitigation systems ([2021b](#)).

This can involve taking action to reduce their impact on ocean ecosystems, in particular blue carbon ecosystems, to further boost nature-based ocean mitigation solutions.

Similar to earlier points made in relation to ocean nature-based solutions for carbon removal, it is imperative that such action is in addition to — and not rather than — a substitute for reducing emissions across the value chain.

RECOMMENDATIONS TO BUSINESS LEADERS

1. **Widen** mitigation measures beyond the value chain by taking action and publicly reporting on actions taken to reverse blue carbon ecosystem loss ([UNFCCC, 2021c](#))
2. **Ensure** ocean nature-based solutions are not used as a substitute for a rapid phase-out of high-emission activities

III. Increase the sustainable ocean business case for resilience, and urgently scale-up risk assessments and adaptation action

While the business case for mitigation is growing with the rise of science-based targets, the contribution of sustainable ocean business to adaptation and resilience is still being articulated. Evaluation of adaptation and resilience success takes on different dimensions depending on variable social and ecological conditions. This complexity constitutes a particular communication challenge. The [UN-led Race to Resilience](#) provides companies with an opportunity to begin taking purposeful steps towards reducing risk and mainstreaming adaptation and resilience measures into their operations. While society and industry are reliant on a stable and functioning biosphere, it is already apparent that certain ocean-based sectors have grown increasingly vulnerable to climate change impacts and other risks.³⁰ Rising sea levels and increased incidence and severity of extreme weather events for instance are already posing a growing risk to safety and operations at sea as well as to the coastal infrastructure that sustains ocean-based industries; and relevant climate hazards — and risks — are growing ([IPCC, 2021](#); [Asariotis, 2021](#)).

Impacts on critical transport infrastructure, including delay and disruptions across supply-chains, may have broad economic and trade-related repercussions and could severely compromise the sustainable development

prospects of the most vulnerable nations ([UNECE, 2020](#); [Pacific Community, 2019](#), [UNCTAD, 2020c](#)). Unless effective adaptation action is taken, ports and other critical coastal infrastructures are projected to be at increased risk of flooding as early as the 2030s ([Monioudi et al., 2018](#); [IPCC, 2019](#)).

Principles of resilience, such as creating redundancy within systems or diversification, may initially seem to be at odds with industrial trends towards optimization and specialization (for example, in the seafood industry where aquaculture is often centred around a single species or single production system). However, companies are already taking initial steps in this area by spreading production systems across diverse geographies, investing in species diversification and experimenting with innovative multitrophic aquaculture systems for instance. The financial and insurance sectors are also taking steps to further quantify the economic losses associated with unexpected disasters which helps to communicate the business case for resilience.

This is supported by a growing body of scientific literature on the social and ecological benefits of resilient landscapes and seascapes. In addition, the insurance sector is developing new products which help to de-risk and therefore encourage investments into climate-resilient projects.

30. For instance, in the seafood industry, challenges associated with climate change impacts on fisheries are shared by local fishing communities and industrial fishing fleets. Climate change is producing shifts in the distribution of aquatic species and this trend is set to continue ([UNFCCC, 2021b](#)).

RECOMMENDATIONS TO PARTIES

- 1. Incentivize** more diversified seafood from low trophic species which are more affordable for developing nations and could potentially fill the nutritional gap ([UN Nutrition, 2021](#)), e.g. aquaculture permits for low trophic species to incentivize industry development
- 2. Establish** policies supporting value addition and improving access to markets in order to sustain local products and livelihoods, including geographical indication of high-value aquaculture and seafood products³¹
- 3. Implement** infrastructure planning and coastal zone management policies and regulatory frameworks, that facilitate evidence-based risk assessment and promote the use of existing standards,³² guidance,³³ best practices, checklists, methodologies³⁴ and other tools in support of adaptation and resilience building

RECOMMENDATIONS TO BUSINESS LEADERS

- 1. Join** the UN-led Race to Resilience to support initiatives helping frontline communities
- 2. Enhance** science-industry collaboration to understand and quantify climate risk exposure and scope for reducing and managing risk through associated adaptation and resilience measures ([Österblom et al., 2020](#))
- 3. Increase** monitoring and maintenance to understand climate-risks to business operations and mainstream consideration of physical climate risks into planning and adaptation

RECOMMENDATIONS TO THE SEAFOOD INDUSTRY

- 1. Aquaculture companies** can accelerate meta-analysis of existing data for resilient supply of raw materials and ensure a local/global balance by facilitating and enabling optimal resilience and efficiency in global trade ([UN Global Compact, 2020f](#))
- 2. Diversify supply chains** by adding value to new or currently undervalued aquatic resources and through the consumption to fish processing co-products and bycatch
- 3. Invest** in species diversification to spread risk and promote local biodiversity (e.g. farming of and research on low trophic level species, including sustainable algae and bivalves)



31. For example, Scottish salmon fed with Scottish feedstock: Council Regulation (EC) No 510/2006 on protected geographical indications and protected designations of origin: Scottish Farmed Salmon 2007.

32. For example, [ISO 14090:2019 Adaptation to climate change — Principles, requirements and guidelines](#); [ISO 14091:2021 - Adaptation to climate change- Guidelines on vulnerability, impacts and risk assessment](#).

33. For example, [PIANC \(2020\)](#)

34. Such as UNCTAD's [Climate Risk and Vulnerability Assessment Framework for Caribbean Coastal Transport Infrastructure](#). [UNCTAD/DTL/TLB/2018/1](#).

4. ADOPT A HUMAN-CENTRED APPROACH TO POLICY AND OPERATIONS

The current ocean economy faces challenges of inequity — from the exclusion or marginalization of small-scale fish producing communities, indigenous peoples and women from political decision-making processes to a range of other labour and human rights abuses in global supply chains ([Österblom et al., 2020](#)). The ongoing COVID-19 pandemic has further exacerbated existing inequalities. The transition to a climate-smart ocean also poses risks to workers and human rights, such as an unequal benefit-distribution of new coastal infrastructure to neighbouring coastal communities. There is also a strong need to acknowledge specific climate vulnerabilities and environmental injustice. Climate change will disproportionately affect communities in LDCs ([Diffenbaugh and Burke, 2019](#)) which face financing and capacity constraints to address its effects ([Ocean Panel, 2020](#)). However, the recovery from COVID-19 and the transition to a net-zero ocean economy provides an opportunity to build back better and ensure more human-centred policymaking and business operations.

I. Integrate environmental justice and human rights considerations in political decision-making processes on the international and national level

International negotiations at the CBD and UNFCCC: Strengthening ocean-climate action requires many voices. The incorporation of local and indigenous knowledge systems is vital to provide co-produced, equitable solutions and people-centred action ([UNFCCC, 2021b](#)). To embed equity into negotiations, Parties can ensure a multi-stakeholder process when designing responses to both the climate and nature crises.

In addition, adherence to international human rights standards, including in relation to the responsibilities that pertain to businesses under the [UN Guiding Principles on Business and Human Rights](#), should be at the core of such global policy measures.

Marine Spatial Planning: MSP is a critical component to address potential conflicts and tap into synergies between marine users. Crucially, it can provide a forum for coastal communities to discuss uses of the marine space as well as provide an opportunity for important local knowledge-sharing. It can also serve as a mechanism to ensure environmental justice by enabling meaningful involvement with respect to the development of environmental policies and law. However, MSP processes are often too high-level and strategic with limited capacities for local engagement. Using tools and methods that meet local and individual needs and context are crucial levers for effective engagement (UN Global Compact, 2021a).

MSP is crucial to the socially responsible advancement of offshore renewable energy. As the development of offshore renewable energy structures might displace old usage rights ([Kerr et al., 2015](#)), it is essential fora are put in place to give communities a voice in the decision-making process around the placement of offshore energy infrastructure, and a share in the material benefits of this infrastructure, including jobs, both directly and via the near-shoring of manufacturing capacity to areas where offshore energy infrastructure is developed. Moreover, if developed in a multi-stakeholder fashion, an MSP process can be an opportunity to build trust between the offshore renewable energy sector and other marine users, including the fishing industry (UN Global Compact, 2021a).

RECOMMENDATIONS TO PARTIES

1. **Ensure** robust inclusion and representation of community, worker and indigenous peoples in international political processes, including when designing NDCs and NAPs in the UNFCCC process
2. **Ensure** comprehensive, transparent and multi-stakeholder representation, in regional and national MSP processes and ensure the transparent implementation or communication of outcomes

II. Incorporate a community lens for climate and societal co-benefits

Ocean sectors that contribute towards climate mitigation and adaptation, such as seaweed farming and offshore renewable energy, are also vital providers of livelihoods. Ensuring a community-centred approach to ocean-based climate solutions is key to contribute towards the broader 2030 Agenda, in particular SDG 8. Community-based resource management benefits from traditional knowledge of local communities, often leading to more widespread social acceptance. Community approaches are being increasingly incorporated into blue carbon projects.

These projects conserve coastal ecosystems to generate carbon credits for the GHG emissions they prevent, which can be sold in carbon markets.

The success of blue carbon projects also rests on their ability to deliver value to its local community ([Bird, 2016](#)). For example, residents of Gazi Bay, Kenya launched a mangrove conservation and restoration project in partnership with several stakeholders ([Commonwealth Blue Charter, 2020](#)). The project has seen support, a high level of participation and sense of ownership from local residents.

RECOMMENDATIONS TO PARTIES AND BUSINESS LEADERS

- 1. Design** ocean nature-based solutions in such a way that integrates and provides societal and communal co-benefits
- 2. Facilitate** business-community cooperation through communication, investment, technical assistance, local knowledge and strategic value to strengthen new and existing community organizations in developing countries
- 3. Increase** community participation and connectivity across the value chain through the development of increasingly integrated digital systems

III. Ensure a 'just transition' for all to a climate-smart ocean economy

The transition to a climate-smart economy must both create and safeguard decent, green jobs.³⁵ This objective is embedded in the Paris Agreement.³⁶ Equitable policies will be required to retrain or upskill millions of workers, including smallholders, to meet the challenges associated with a transition to net-zero. The scale of the transition to net-zero will be particularly significant in regions with traditionally carbon-intensive industries. The transition to a climate-smart ocean brings with it opportunities for decent, fairly paid "blue jobs" as well as an expected shift in job types. Due to predicted crew reductions at sea — following increased remote management and monitoring of vessels — it is likely there will be a greater number of jobs ashore for maritime workers ([ILO, 2019](#)). It is imperative that safe crewing levels are maintained in the transition to new automation technologies.

Ocean industries can be a key future green job provider. The offshore renewable energy industry has the potential to create millions of jobs, while revitalizing coastal communities far from urban economic centres ([GWEC, 2021](#); [Ryestad Energy, 2021](#)). Moreover, the decarbonization of shipping likely brings with it job opportunities across the entire zero emission fuel production value chain. As such new blue jobs might necessitate re-skilling and retraining, efforts must be made to ensure the costs of skills development or reskilling are not borne by workers. It also key to ensure knowledge and skills-transfer to developing countries, which will be essential to unlock their potential to produce zero emission fuels ([World Bank, 2021](#)).

The safety aspect of blue jobs must also be adequately considered. As the offshore renewable energy industry develops, special care must be taken to ensure safety for workers, including comprehensive training and implementing safety measures to prevent machinery misuse ([Partida, 2021](#)).

35. A 'green job' has been defined as a job which reduces the environmental impacts of enterprises and economic activities while providing decent working and living conditions for all workers and ensures that workers' rights are respected ([UN, 2019](#)).

36. Under the Paris Agreement, national plans on climate change must "take into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities" (Paris Agreement, 2015).

Industries transitioning to new zero-carbon fuels and technologies, such as the maritime industry, should also ensure accessibility to safety training, as well as the necessary skills transfer and knowledge-sharing to developing countries.

Inclusive social dialogue and stakeholder engagement involving all actors — including social partners — must be at the core of a just transition. In the maritime industry, the transition to zero-carbon shipping should include decision-making over health and safety standards, space for collective bargaining over a broader range of conditions and participation in the creation of training programmes and standards (UN Global Compact, 2021c).

There is also a need to ensure support for industries in adapting to climate change, such as small-scale fisheries. Climate change already is and is expected to further modify species distribution and abundance ([Barange et al., 2018](#)), which will affect small-scale fisheries that are playing a vital role in providing livelihoods for millions, essential nutrition to billions and contributing substantially to household, local and national economies and economic growth ([FAO, 2020](#)).

In the marine fisheries subsector, small-scale fisheries are estimated to provide 90 per cent of the employment ([World Bank, 2012](#)). Global transition funds are of vital importance in this context. Ensuring transition funds for climate resilient and adaptive fisheries management as well as compensation, climate resilient infrastructure and access to effective monitoring for climate change threats is vital to support the role of small-scale fisheries.

RECOMMENDATIONS TO PARTIES

- 1. Commit** to a just transition following ILO Guidelines within the framework of national energy and climate policies, for instance through establishing Just Transition mechanisms³⁸
- 2. Ensure** that jobs within the ocean economy constitute decent work (fair income, safety, rights at work, insurance and social protection)
- 3. Ensure** evidence-based research is conducted on the impacts of climate policies on social and employment outcomes in the Ocean Economy to inform social dialogue and policy decisions
- 4. Implement** skills development and upgrading measures to enable transitions in ocean economy labour markets and stimulate blue job creation
- 5. Ensure** more robust inclusion of workers and enterprises in decision-making at policy levels through social dialogue mechanisms
- 6. Implement** social protection policies to protect workers and vulnerable groups in the context of climate adaptation and mitigation strategies, such as funding for climate-resilient fisheries management

RECOMMENDATIONS TO PARTIES

- 1. Incorporate** [Principle 7 of the UN Global Compact Sustainable Ocean Principles](#) into business operations to ensure a human-centred approach to sustainable ocean business
- 2. Establish** and implement decision-making mechanisms for workers to enable collective voices in the transition
- 3. Ensure** transition plans are founded in and informed by stakeholder engagement and social dialogue and are consistent with corporate human rights responsibility as set out in the [UN Guiding Principles on Business and Human Rights](#)
- 4. Consider** relevant international guidelines³⁹ and Just Transition Indicators in business operations⁴⁰
- 5. Make** sure that climate change risk management takes potential risks to human rights into account⁴¹

38. ILO Guidelines for a Just Transition (2015).

39. Ibid.

40. The World Benchmarking Alliance has recently released a '[Just Transition](#)' methodology which outlines six indicators to be considered by businesses to ensure a just transition.

41. Such thinking is aligned with moves towards environmental human rights due diligence. For instance, in Europe, a draft mandatory human rights and environmental due diligence law is expected at the end of summer and sustainability reporting standards are being strengthened.

5. HARNESS BLUE FINANCE

I. Close the climate-nature investment gap while ensuring climate investment includes ocean investment

Current climate and nature investments fall well below what is required. Estimates of the investment required to achieve the low-zero carbon transition range from \$1.6 trillion to \$3.8 trillion annually between 2016 and 2050 for supply-side energy system investments alone (Buchner et al., 2019)⁴² while adaptation costs faced by developing countries alone will be in a range of \$140 billion to \$300 billion per year by 2030 (UNEP, 2016).

Developed regions are by far the largest recipients of climate finance while developing economies receive only a small portion (Ameli et al., 2021).⁴³ Investments are also falling short when it comes to nature. To avoid global nature loss, a total investment in nature of \$8.1 trillion is required between now and 2050 (UNEP, 2021).

As we move towards closing the nature-climate investment gap, it is vital to ensure that climate investment includes ocean investment. Despite the ocean's ability to address both climate mitigation and adaptation, funding for the ocean from finance institutions has been limited to date (WWF, 2021). Indeed, while the benefits protecting natural blue capital far exceed the cost, there remains a large financing gap (Turley et al., 2021).

This is often due to the investment community's lack of widespread understanding of how investing in the ocean can produce a timely and productive return. In addition, there's a limited pipeline of risk-adjusted, investable projects to attract financing and insufficient data and modelling capabilities for investors to quantify ocean-derived risk.

RECOMMENDATIONS TO PARTIES

Unlock public/multilateral financing to support emerging markets in developing ocean management plans

RECOMMENDATIONS TO FINANCIAL ACTORS

- 1. Financial institutions** need to recognize the centrality of sustainability to decision-making (e.g. through using instruments such as the [Taskforce on Climate-Related Financial Disclosures](#) (TCFD))
- 2. Embed science-based targets** into sustainability-linked bonds and climate financial standards
- 3. Educate** potential issuers and finance stakeholders to improve investor confidence and enable beneficial pricing
- 4. Insurance providers** to continue to work on quantifying ocean-derived risk, increasing scientific collaboration to enhance modelling capabilities

42. In 2017/18, climate finance flows reached \$574 billion per year on average, resulting in total climate finance flows of \$608 billion in 2017 and \$540 billion in 2018 (Buchner et al., 2019).

43. While developed countries committed to jointly mobilize \$100 billion per year by 2020 in support of climate action in developing countries, the target is not being met. Even though climate finance is on an upward trajectory, the latest available data for 2018 is at \$79 billion per annum (United Nations, 2021).

II. Create a market pull for climate-smart ocean business through mechanisms such as blue bonds as well as sustainability-related conditions for financing

Blue finance innovations are emerging to mobilize public and private capital to solve social and environmental challenges and signal responsible ocean stewardship in line with the SDGs and the Paris Agreement ([UN Global Compact and IDB Invest, 2021](#)). This includes the development of new capital market instruments, such as blue bonds, but also developing finance and insurance concepts for coastal zone resilience and blue infrastructure. There is growing appetite for such sustainable financing instruments within the financial community ([Fritsch, 2020](#)) as well-illustrated by multiple recent developments in the blue finance market, including Asia's inaugural blue bond ([Bank of China](#)) and the Seychelles Blue Bond, the world's first Sovereign Blue Bond ([World Bank, 2018](#)). To further unlock private capital towards ocean-climate solutions, it is critical to create an enabling environment.⁴⁴ As already evidenced in the green bond market, entering into partnerships with multilateral banks can be an important step to creating this environment and facilitate issuances to build the market.⁴⁵

The financial markets will play an essential role to help de-risk innovative investments and award those pioneering the transition to net-zero. Corporate issuers are becoming increasingly active in the blue space, including the first sustainability-linked bond issued to a shipping company ([Odfjell](#)), a sustainable loan issued to an aquaculture company called [AgroSuper](#), as well as green bonds issued by aquaculture companies [Grieg Seafood](#) and [MOWI](#) ([UN Global Compact, 2021e](#)). Blue finance can also play a key role in creating a market pull for science-based targets. Setting such verifiable targets as pre-conditions for financing will help incentivize ambitious target setting while ensuring that the funding is going to a truly sustainable project and/or company. Both investors and issuers should benefit from any market "greenium" associated with an issue that incorporates a SBT.

While innovative financial mechanisms play a key role, it is also important to further leverage traditional finance as other 'financial gatekeepers' play an important role in sending a market demand for climate-smart business ([UN Global Compact, 2021d](#)). Indeed, most ocean-linked financing comes from more traditional financial instruments such as corporate loans ([UNEP FI, 2021](#)). Players from insurance companies to stock exchanges can also exercise their collective leverage and set sustainability requirements into contracts ([Jouffray et al., 2019](#)).

RECOMMENDATIONS TO PARTIES

Provide the impetus for financial institutions by implementing mandatory non-financial sustainability factors into the banking risk system, such as climate risk

RECOMMENDATIONS TO FINANCIAL ACTORS

- 1. Adopt** the [UN Global Compact Sustainable Ocean Principles](#) and [UNEP FI Sustainable Blue Economy Finance Principles](#)
- 2. Develop** or coalesce on transparent, measurable, and verifiable criteria/KPIs for sustainable ocean business, in conjunction with sector experts
- 3. Multilateral development banks** can enter into partnerships with commercial banks to enhance investor confidence with triple A ratings, thereby contributing to creating the enabling environment needed to unlock private capital towards ocean action

44. In order to transform the private sector approach to ocean assets, two complementary initiatives — the UN Global Compact and UNEP FI's Sustainable Blue Economy Initiative — have been working to build sustainable practices supporting the incorporation of SDG 14 into business considerations.

45. For instance, through partnering with the World Bank and its triple A rating, Credit Suisse was able to inspire investor confidence in the Blue Economy ([World Bank, 2018](#)).

RECOMMENDATIONS TO BUSINESS LEADERS

1. **Companies** can consider issuing a blue or green bond to unlock financing, utilizing existing frameworks and guidelines⁴⁶
2. **In conjunction** with the finance value chain, continue to develop and incorporate transparent, verifiable criteria for sustainable ocean business into their financial instruments

III. Invest in ocean management, knowledge generation and blue infrastructure through harnessing private, public and blended financial mechanisms

Increased public and private investments, including through blended finance mechanisms in particular, are needed to support developing countries to generate missing ocean knowledge through research and capacity development, build strong sustainable blue economy strategies and gain access to financing for green and blue infrastructure to adapt to climate change (UNCTAD, 2021). OECD estimates that \$6.9 trillion in infrastructure investment will be needed annually to meet the SDGs by 2030 (2017). A major scaling up of investment and capacity-building for developing countries will also be critical to 'build back better' as part of COVID-19 recovery efforts. The overall net benefits of investing in resilient infrastructure in developing countries could amount to \$4.2 trillion over the lifetime of new infrastructure — a \$4 benefit for each dollar invested in resilience (Hallegatte et al., 2019).

Innovative financial instruments also play an important role in supporting emerging markets in the development of sustainable ocean management plans. The proceeds from the aforementioned Seychelles Blue Bond supported the expansion of marine protected areas and improved governance of priority fisheries.

Spatial planning itself can improve the level of certainty, safety, transparency and predictability of private investments, triggering a ripple effect of further investment and economic growth (UN Global Compact, 2021a).

Ensuring participation in such ocean management plans as well as other activities will often require capacity-building, which in turn has its own financing requirements. Such capacity-building should also include educating potential Government issuers, supported by multilateral development banks and institutions.

RECOMMENDATIONS TO PARTIES

1. **Leverage** blended finance solutions, including for nature-based solutions that offer both climate and ocean benefits
2. **Support** targeted capacity-building, including finance, technology and human capacity-building

RECOMMENDATIONS TO FINANCIAL ACTORS

1. **Financial arrangers** to undertake measures to de-risk first movers⁴⁷
2. **Help** sustainable ocean companies gain funding through harnessing innovative financial mechanisms, such as blue bonds, in line with international standards and principles

46. For example, see [UN Global Compact \(2020\)](#).

47. Sustainable financial mechanisms such as green and blue bonds should come with a lower interest rate when adhering to a credible and sustainable framework.

6. PRIORITIZE INDUSTRY-POLICY-SCIENCE COLLABORATION ON DATA COLLECTION, SHARING AND MANAGEMENT

The potential of the ocean to mitigate and adapt to climate change must be accompanied by sound science. Such science must be transformative, inclusive and solutions-oriented. Science and innovation are key to the advancement of ocean-climate solutions, including addressing the engineering challenges associated with providing safer, more efficient, more cost-effective and more sustainable data collection and addressing the coordination and technical challenges associated with making collected data inter-operable and accessible. Science and innovation also play a key role in providing baseline data for marine spatial planning and encouraging stewardship of marine resources. Ocean-climate measures must be responsible, science-based and protective of the marine environment. The UN Decade of Ocean Science for Sustainable Development (the Ocean Decade) is a vital framework to advance scientific knowledge-sharing and research into such ocean-climate solutions, and it drives science-based engagement with all stakeholders, including businesses and industries, operating in the ocean.

I. Improve collection, sharing and collective data management for climate-smart ocean business

Better data, in terms of types, coverage, density and accessibility are critical for science-based business decisions. There is a need to strengthen existing knowledge management and sharing platforms on climate-related impacts, risks and best practices. For instance, strong data collection, distribution and management frameworks are vital for companies accounting for and mapping Scope 3 emissions when setting a science-based target (UN Global Compact, forthcoming 2022). It is key that all businesses, including small and medium-sized enterprises (SMEs) — especially those in developing countries — can access, contribute to and benefit from such knowledge. Collective data management with the full engagement of companies and smallholders operating in the ocean is required for advancing technology and innovation,

including expanding storage capacity and design, improving performance, reliability, durability and monitoring of maritime infrastructure and activities in the ocean and enhancing the forecasting and prediction capabilities of the impacts on the ocean and climate of that maritime infrastructure and activities. The goal is to achieve a comprehensive digital representation (twin) of the ocean, including a dynamic ocean map, which provides free and open access for exploring, discovering, and visualizing past, current and future ocean, and by extension, climate conditions.

RECOMMENDATIONS TO BUSINESS LEADERS

1. **Actively engage** in the UN Decade of Ocean Science and other emerging opportunities for collection, sharing and collective data management
2. **Strengthen** existing knowledge management and sharing platforms on climate-related impacts, risks and good practices
3. **Ensure** that all businesses, but especially SMEs — particularly those in developing countries — can access, contribute to and benefit from collective knowledge of the data management
4. **Businesses** should share non-commercially sensitive data, where appropriate, in line with the Sustainable Ocean Principles (8 and 9)

RECOMMENDATIONS TO PARTIES AND BUSINESS LEADERS

1. **Accelerate** public-private data-sharing opportunities contributing to the advancement of ocean-climate solutions
2. **Develop** an environment that encourages public-private partnerships to accelerate ocean science data collection, sharing and management
3. **Develop** equitable frameworks that encourage, motivate, and incentivize the private sector to provide public access to their ocean-climate data

BOX 6**IMPROVING OCEAN DATA AND KNOWLEDGE MANAGEMENT THROUGH THE OCEAN DECADE**

Colossal amounts of ocean data and knowledge already exist throughout the world, but unfortunately these data are often not shared, visible or accessible, and Throughout and via the Ocean Decade, partners will generate much more ocean data and it is critically important that these data are organized, managed and freely available.

To this end, the Ocean Decade includes an important focus on improved data and knowledge management to optimize the use of existing data and knowledge and to ensure that new data and knowledge produced during the Decade are accessible, adapted to the needs of users and benefit society.

The Decade aims to create 'a shared digital ecosystem of the ocean' that promotes interoperability across scales and across systems and that by building on existing systems, will avoid massive new infrastructure investments. Private sector and industry partners will be key actors in the co-design and co-delivery of this ecosystem.

This shared digital ecosystem will embrace a culture of timely, free and open-access use and re-use of data, information and knowledge. It will create new opportunities for participation of all ocean science actors from industry and local and indigenous knowledge holders. The ecosystem will be collectively developed over the life of the Decade and is intended to be a key legacy of the Ocean Decade that underpins and contributes to all other Ocean Decade achievements.

(Adapted from: [Ocean Decade Implementation Plan, 2020](#))

II. Accelerate robust scientific research to improve the measuring of ocean-climate solutions

To enable better measurement and understanding of the contribution of blue carbon ecosystems and other ocean-climate solutions at a global level, more concrete, data-driven, scientifically-sound and evidence-based frameworks and methodologies are needed. This is particularly relevant for those nations holding a large percentage of the world's coastal blue carbon ecosystems ([UNFCCC, 2021b](#)). For instance, while natural seaweed forests contribute to blue carbon sequestration, they are not currently included in blue carbon budgets.

Carbon methodologies to account for sequestration have yet to be developed as this is still an emerging area of blue carbon science, making robust carbon sequestration estimates challenging (UN Global Compact, 2021b).

Collecting ocean science data to create a baseline and establish a monitoring program to gain a better understanding of marine ecosystems is essential for planners and decision makers, as is developing knowledge about multi-stressors in the marine environment to help better manage marine resources and preserve ocean space.

RECOMMENDATIONS TO PARTIES AND BUSINESS LEADERS

- 1. Develop** more concrete, data-driven and evidence-based targets related to improving understanding of the contribution of blue carbon ecosystems to carbon budgets
- 2. Develop** carbon methodologies to account for the contribution of marine ecosystems to carbon sequestration

III. Work towards a data-driven MSP process

Data and information from science and other sources should be the foundation for climate-smart MSP. An evidence-based and participatory approach is best practice to develop marine spatial planning solutions that identify, resolve or manage the conflicts and uncertainties surrounding possible impacts from locating technologies and activities in a view of future maritime growth and projected increased risks in marine areas related to uncertainty resulting from climate change impacts (IPCC, 2019). Data and information are needed to increase and broaden our understanding of the possible pathways through which climate change is impacting or might impact marine ecosystems and coastal infrastructure.

This information will be needed at appropriate spatial and temporal scales to avoid or minimize impacts or respond with mitigation and adaptation measures if the former is not possible. In the new value chain, inclusive approaches for collecting data will enhance development of solutions for adaptive techniques in order to conserve the sea space and encourage long-term stewardship of the marine resources.

Collaboration is key for climate-smart MSP in the new value chain. Intergovernmental, cross-sectoral and cross-industry collaborations are needed. There is also an important opportunity for an increase in public-private partnerships, for instance, between the offshore renewable energy sector and public authorities. For example, the offshore renewable industry collects data for their operations which is relevant also in coastal adaptation, biodiversity, resilience and MSP.

This data can also be of added value to climate change-related adaptation and resilience for coastal states and in the steering of innovation to support the development of environmental mitigation solutions (UN Global Compact, 2021a). At the same time, this collective data will support pushing innovation and safety into spatial co-location of technologies that will provide business benefits by enhancing the marine space use and enabling a more stable power generation in the grid.

RECOMMENDATIONS TO BUSINESS LEADERS

- 1. Support** the formation of data coordination groups to ensure strategic and coordinated collection, sharing and harmonization of data across borders and agencies
- 2. Advance** data-sharing between ocean sectors, such as the offshore renewable energy industry, aquaculture and shipping, and MSP planners and government
- 3. Strengthen** capacities for the integration of shared industry data to safeguard the resilience of the ocean and to deal with uncertainties in planning and decision-making (e.g. through creating models for industry data-sharing to support emerging markets, e.g. commitment through Global Biodiversity Information Facility (GBIF))

RECOMMENDATIONS TO PARTIES AND BUSINESS LEADERS

- 1. Enhance** experience sharing across sea basins and regions globally to ensure timely preparation and to benefit from knowledge and learning exchanges between countries and ocean industries
- 2. Support** the formation of data coordination groups to ensure strategic and coordinated collection, sharing and harmonization of data across borders, ocean industries and businesses

IV. Advance ocean literacy across all communities

Increased ocean literacy leads to more informed participation in the discussion on the importance of the ocean and the future of the ocean and its resources in a changing climate (Turley et al., 2021). This in turn leads to more effective decision-making in ocean-related processes.

Ocean-climate literacy is a key component to climate-smart Marine Spatial Planning stakeholder engagement processes whereby trade-offs between ocean users are discussed in the context of the climate emergency (UN Global Compact, 2021a).

RECOMMENDATIONS TO PARTIES

1. **Policymakers to incorporate** ocean literacy into MSP processes to help educate the constituency
2. **Develop and build** upon ocean literacy models aimed at secondary and post-secondary education
3. **Identify and secure** long-term financing for ocean literacy at multiple scales (local, sub-national, national and regional)

RECOMMENDATIONS TO BUSINESS LEADERS

1. **Consider developing** — including for example through business associations — webinars or other (e-)learning tools to educate employees and stakeholders on ocean issue



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Lead Author: Martha Selwyn, United Nations Global Compact

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THE TEN PRINCIPLES OF THE UNITED NATIONS GLOBAL COMPACT



HUMAN RIGHTS

- 1 Businesses should support and respect the protection of internationally proclaimed human rights; and
- 2 make sure that they are not complicit in human rights abuses.



LABOUR

- 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- 4 the elimination of all forms of forced and compulsory labour;
- 5 the effective abolition of child labour; and
- 6 the elimination of discrimination in respect of employment and occupation.



ENVIRONMENT

- 7 Businesses should support a precautionary approach to environmental challenges;
- 8 undertake initiatives to promote greater environmental responsibility; and
- 9 encourage the development and diffusion of environmentally friendly technologies.



ANTI-CORRUPTION

- 10 Businesses should work against corruption in all its forms, including extortion and bribery.

The Ten Principles of the United Nations Global Compact are derived from: the Universal Declaration of Human Rights, the International Labour Organization's Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption.

ABOUT THE UNITED NATIONS GLOBAL COMPACT

As a special initiative of the UN Secretary-General, the **United Nations Global Compact** is a call to companies everywhere to align their operations and strategies with Ten Principles in the areas of human rights, labour, environment and anti-corruption. Our ambition is to accelerate and scale the global collective impact of business by upholding the Ten Principles and delivering the Sustainable Development Goals through accountable companies and ecosystems that enable change. With more than 13,000 companies and 3,000 non-business signatories based in over 160 countries, and 70 Local Networks, the UN Global Compact is the world's largest corporate sustainability initiative — one Global Compact uniting business for a better world.

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