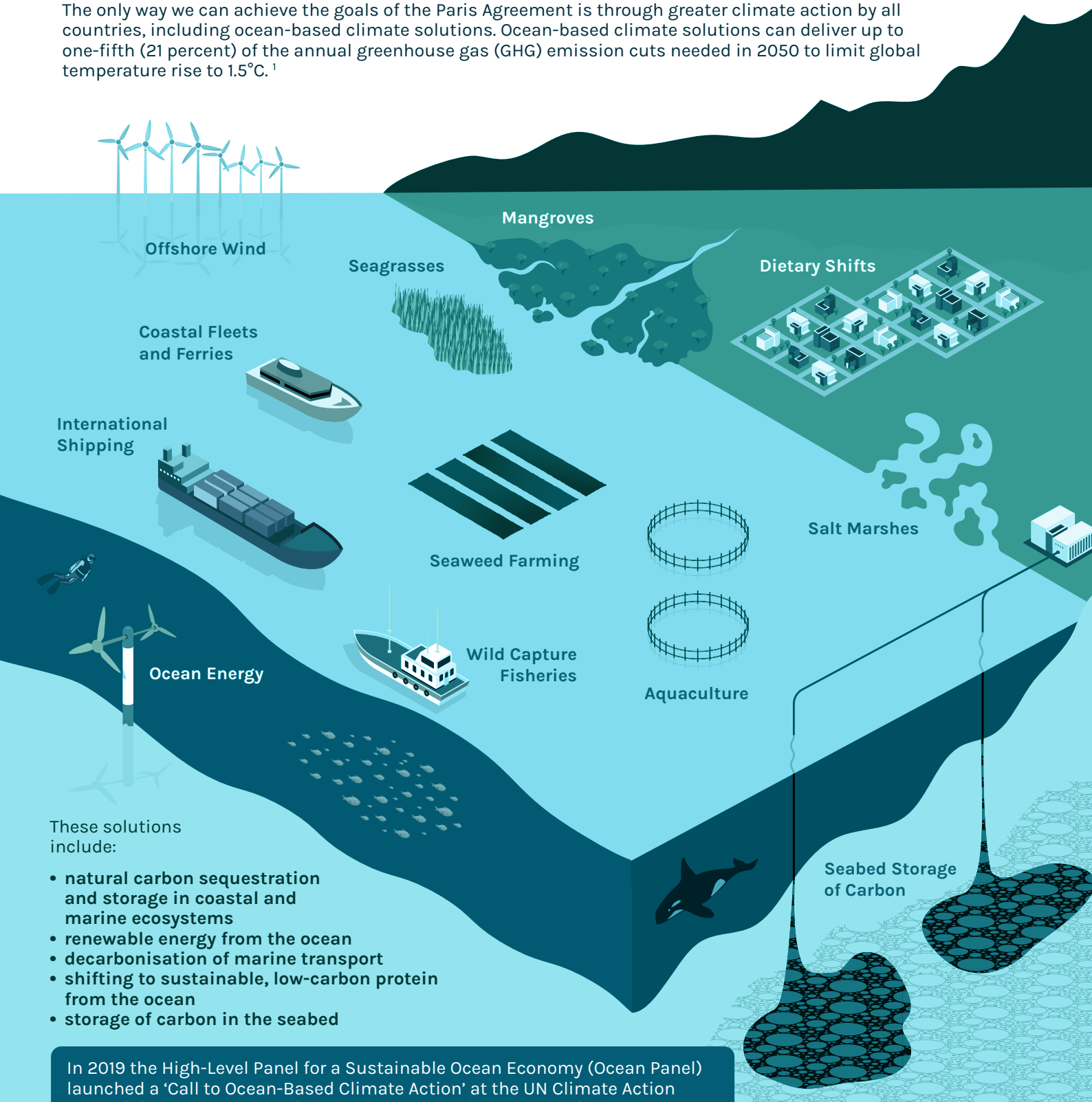
Advancing Ambitious Ocean-based Climate Action

HIGH LEVEL PANEL *for*
A SUSTAINABLE
OCEAN ECONOMY

The ocean is the life source of our planet and vital for healthy human societies and a thriving world economy.

The health of the ocean, and the livelihoods and economies that depend on it, requires the world to urgently reduce greenhouse gas emissions in line with the goals of the Paris Agreement.

The only way we can achieve the goals of the Paris Agreement is through greater climate action by all countries, including ocean-based climate solutions. Ocean-based climate solutions can deliver up to one-fifth (21 percent) of the annual greenhouse gas (GHG) emission cuts needed in 2050 to limit global temperature rise to 1.5°C. [1]



These solutions include:

- **natural carbon sequestration and storage in coastal and marine ecosystems**
- **renewable energy from the ocean**
- **decarbonisation of marine transport**
- **shifting to sustainable, low-carbon protein from the ocean**
- **storage of carbon in the seabed**

In 2019 the High-Level Panel for a Sustainable Ocean Economy (Ocean Panel) launched a 'Call to Ocean-Based Climate Action' at the UN Climate Action Summit in New York to outline a pathway towards greater action on ocean-based climate solutions. **More action is needed. We all must act now.**

Ocean Panel Action is Showing the Way

The Ocean Panel has been encouraged and inspired by the groundswell of momentum on ocean-based climate solutions since launching its Call to Action in 2019 including the Ocean for Climate Declaration, Because the Ocean Declarations, Rise Up - Blue Call to Action, The Ocean Super Year Declaration, and High Ambition Coalition for Nature and People.

Significant global progress has been made, not least through agreement in the COP26 Glasgow Climate Pact to strengthen ocean-based action within the UNFCCC, but the latest IPCC reports emphasise the gap that remains between ambition and action. The solution set and pathways for implementation are well established. What is required now is collaboration across government and industry to rapidly accelerate ambition and action to close the gap.

The Ocean Panel remains committed to ocean-based climate action and urges all actors to join them in advancing ambitious ocean-based solutions to support global efforts to urgently reduce GHG emissions.

To inspire others, examples of action and ambition from the 17 members of the Ocean Panel are outlined in the following pages, within six areas of opportunity: marine conservation, ocean-based renewable energy, marine transport, sustainable ocean-based food, carbon capture and storage in the seabed and research and observation.

Ocean-based climate solutions offer a multitude of additional benefits, including employment opportunities, coastal resilience, enhanced biodiversity, global food security, improved water quality and health, and improved income opportunities and livelihoods in coastal areas.

Restore and Protect Coastal Ecosystems

Coastal and marine ecosystems such as mangroves, seagrasses and saltmarshes are known as 'blue carbon' ecosystems for their ability to sequester and store carbon. Their protection, conservation and or restoration offers considerable mitigation potential as well as improved coastal resilience and a host of additional co-benefits including water quality, biodiversity, improved fisheries and local employment. They are hotspots for carbon storage, with soil carbon sequestration rates per hectare up to 10 times larger than those of terrestrial ecosystems. [2]

Restoring and conserving these ecosystems globally could result in as much as 1.38 $GtCO_2e$ sequestered and stored per year by 2050. [3]

Examples of Ocean Panel action:

- **Portugal**, **Japan**, the **UK** and the **US** have committed to protect 30 percent of national waters by 2030. Australia has over 45 percent under protection already.
- **Indonesia** has allocated IDR 15 billion (USD 1 million) to support blue carbon ecosystems through rehabilitating 210 hectares of mangroves in 10 locations nation-wide in addition to its commitment to designate 30 million hectares for the MPA by 2030 (of which over 23 million hectares are already under protection).
- **Canada** is investing almost CAD 1 billion (USD 737 million) in funding over five years to reach the target of conserving 25 percent of Canada's ocean by 2025. [4]
- **Jamaica** has secured 57 hectares of wetland for ecological restoration as part of the development of the Falmouth Cruise Ship Pier, earmarking these wetlands for carbon sequestration and storage.
- **Kenya** continues to support Mikoko Pamoja, the world's first community-led project to restore and protect mangrove forests through the sale of carbon credits. [5]
- The **UK** is progressing the evidence base for the protection and restoration of blue carbon habitats, both internationally through the new Global Ocean Decade Programme for Blue Carbon (GO-BC), and domestically through the establishment of its UK Blue Carbon Evidence Partnership.
- The **UK**, in partnership with the **US**, **Chile**, **Costa Rica** and **France** have launched the International Partnership on Marine Protected Areas (MPAs), Biodiversity and Climate Change.

Priorities for further action: Conserve existing coastal and marine ecosystems to prevent further release of GHG emissions and scale up restoration efforts to increase opportunities for carbon sequestration and storage and coastal protection. Pursue high quality blue carbon projects that include equitable benefit sharing opportunities for Indigenous Peoples and local communities. Explore the potential of additional marine ecosystems, such as seaweed, as an alternative fuel and feed source to further reduce emissions. Include quantified nature-based solutions within nationally determined contributions (NDCs) and other relevant climate policies for mitigation and adaptation, with robust accounting and through advancing the scientific evidence base on blue carbon. Protect and restore reefs as important and integrated coastal defence systems for ensuring the protection of coastal blue carbon ecosystems.

"The ocean — it's our home, it's our lifeline, it's what makes us who we are. It was a huge victory at COP26 to finally see the ocean take a more central role in the climate change dialogues. The Glasgow Pact validated the bitter reality that ocean and coastal communities bear the brunt of climate change."

Surangel S. Whipps Jr

President of Palau and Co-Chair of the Ocean Panel

"We are members of the Ocean Panel because we agree that the oceans are essential to human survival and to solving some of the greatest challenges humanity has ever faced. Not least, climate change."

Jonas Gahr Støre

Prime Minister of Norway and Co-Chair of the Ocean Panel

Scale Ocean-based Renewable Energy

Ocean-based technologies — such as offshore wind (using fixed and floating technology), wave, tidal and floating solar — offer significant potential for renewable energy. Offshore wind energy resources alone would be sufficient to cover more than the world's electricity demand in 2050. [6] However, delivery of offshore wind projects must be significantly increased to fulfill this potential.

Scaling ocean-based renewable energy globally could result in as much as 5.4 $GtCO_2e$ reduced (as a result of switching from coal-fired power plants) per year by 2050. [6] This is equal to taking over 1 billion cars off the road per year.

Examples of Ocean Panel action:

France aims to reach an installed offshore wind power capacity (bottom-fixed and floating) of 2.4 GW in 2023, and approximately 5 GW in 2028 and 40 GW in 2050. France will also set aside EUR 1 billion (USD 1 billion) to help the development of emerging technologies such as floating wind. [7]

The **UK** aims to deploy up to 50 GW of offshore wind by 2030, with up to 5 GW from floating offshore wind. This will be supported by an investment of up to GBP 160 million (USD 185 million) in ports and supply chains and GBP 31 million (USD 36 million) in R&D to support the sustainable deployment of offshore wind. [8]

Indonesia is in the process of developing Tidal Power Plant in Larantuka, Flores, with capacity up to 300 MW.

Namibia commits to enhance the use of renewable energy potential across the ocean and coastal environments (hydro, desalination, fogging, solar, wind, biomass and geothermal) in its updated Nationally Determined Contribution. [9]

Canada is investing in tidal energy, including through CAD 28.5 million (USD 21 million) to Sustainable Marine in Nova Scotia to deliver Canada's first ever floating tidal energy array. [10]

Portugal will invest in the production of ocean renewable energy, promoting the capture of new investments, to reach 10 GW by 2030. [11]

Norway will allocate areas for 30 GW offshore wind power production by 2040. Two areas have been opened for offshore wind: Sørlige Nordsjø II (3000 MW) and Utsira Nord (1500 MW), and the world's largest floating offshore wind park, Hywind Tampen, is about to be realised off the coast of Norway. [12]

Australia announced the first area to be considered for offshore renewable energy projects, along with five other areas to follow under the *Offshore Electricity Infrastructure Act 2021*. [13]

Japan aims to generate approximately 1 GW of offshore wind power per year for 10 years, awarding capacity of 10 GW by 2030 and 30-45 GW by 2040. [14]

The **US** has committed to produce 30 GW of energy from offshore wind by 2030 and deploy 15 GW of energy from floating offshore wind and lower costs of floating technologies by 70 percent by 2035. [15]

Priorities for further action: Develop ambitious national targets to increase the share of renewable energy in the energy mix, provide a stable economic and regulatory framework to stimulate investments in required infrastructure for an accelerated deployment of ocean-based energy systems, reduce barriers to scaling up offshore wind (fixed and floating turbines) and invest in new, innovative ocean-based energy sources such as floating solar photovoltaics, wave power, and tidal power.

Decarbonise International and Domestic Marine Transport

Shipping is a significant enabler of world trade and economic development but is also a major source of emissions. If shipping were a country, it would be the world's 8th largest emitter of GHG emissions. To set international shipping on an ambitious, zero-emission trajectory aligned to 1.5°C, the sector must transition away from using fossil fuels, supported by the necessary technology and infrastructure to produce safe and scalable zero-emission fuels including, distribution, storage, and bunkering.

Fully decarbonising international and domestic marine transport could result in as much as 1.8 $GtCO_2e$ reduced per year by 2050. [16]

Examples of Ocean Panel action:

Fiji has committed to reduce domestic maritime shipping GHG emissions by 40 percent by 2030 and the aim of complete decarbonisation by 2050 through the Pacific Blue Shipping Partnership. [17]

Chile established the Chilean Green Corridors Network with Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping to create a network of green corridors allowing for green maritime transportation of goods in and out of Chile and establish frameworks for the use of zero-or low-emission fuels. [18]

The **US** [19] and **Australia** working with the International Maritime Organization, will achieve zero emissions from international shipping by 2050.

Japan aims to put zero-emission ships in commercial service for international shipping by 2028 [20] and to achieve net-zero GHG emissions from international shipping by 2050.

Palau has launched a new project to mitigate the tourism sector's carbon footprint and establish Palau as the world's first Carbon Neutral Tourism Destination. The project will develop a first-of-its-kind carbon management programme for visitors to calculate and offset the carbon footprint associated with their trip.

Canada's Clean Marine Research, Development and Demonstration Program will fund up to CAD 1.2 million (USD 885 thousand) for project proposals from Canadian industry and academic partners to test and demonstrate zero-emission propulsion (ZEPS) technologies on marine vessels greater than 15 gross tonnage, including battery electric and fuel cell systems. [21]

Norway has transitioned 42 percent of ferries in domestic traffic to electric power (58 ferries in successful operation and 26 on order). The world's first fully electric high-speed passenger vessel in public service was delivered in 2022.

The **US** and **Norway** launched the Green Shipping Challenge to encourage governments, ports, maritime carriers, cargo owners, and others in the shipping value chain to come forward with concrete steps that will help put the international shipping sector on a credible pathway this decade toward full decarbonisation no later than 2050.

Indonesia has implemented IMO Resolution MEPC.320(74) on Guidelines for Consistent Implementation of the 0.50 percent Sulphur Limit Under MARPOL Annex VI through Government Regulation 31/2021 on Shipping Management.

Australia, **Canada**, **Chile**, **Fiji**, **France**, **Japan**, **Norway**, **Palau**, **UK** and the **US** are signatories to the Clydebank Declaration for Green Shipping Corridors. [22]

Priorities for further action: Implement available technologies to increase energy efficiency and support the development of low-carbon fuels as part of a broader decarbonisation of ocean industries and energy supply chains, including port facilities. Implement programmes to decarbonise domestic maritime transport through supporting affordable and effective low-carbon technologies and establishing appropriate targets, incentives and funding mechanisms.

Sustainable Food from the Ocean

Food from the ocean, produced sustainably and using best practices, can have some of the lowest GHG emissions per unit of protein produced of all protein sources. [23] Increasing ocean-based food in the global diet, and reducing the share of animal-based foods, can contribute significantly to efforts to reduce emissions. At the same time, there is an urgent need to address the increasing challenges facing the fisheries and marine aquaculture sector as a result of changing climate and ocean conditions, in particular warming temperatures, deoxygenation, and acidification, through innovative, inclusive, effective and adaptive fisheries management measures.

Reducing emissions from fisheries and aquaculture and shifting diets towards low-carbon ocean proteins (and away from high-carbon land-based protein) could result in as much as 1.24 $GtCO_2e$ reduced per year by 2050. [24]

Examples of Ocean Panel action:

Jamaica has allocated JAM 99.6 million (USD 6.5 million) to enhance fishing and aquaculture communities' resilience to climate change through the 'Promoting Community-Based Climate Resilience and the Fisheries Sector Project'. [25]

Ghana is implementing the Feed the Future Ghana Fisheries Recovery Activity (GFRA), a five-year (2021-2026), USD 17.8 million activity funded by the United States Agency for International Development to reduce fishing pressure and improve small pelagic fisheries management to encourage ecological sustainability and marine biodiversity conservation, while also improving the socioeconomic well-being, food security, and resilience of fishers and coastal communities. [26]

Palau has launched the 2022 Keled A Ngercheled (Our Food is Our Responsibility) initiative to increase food security by supporting local fishers and farmers and increasing awareness of environmentally and culturally sustainable methods to reach food security, including through cultivating a giant clam aquaculture initiative through community-based programmes. [27]

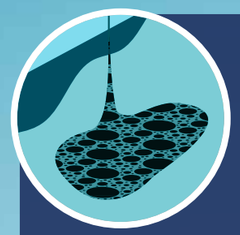
Namibia has committed to reduce fishmeal-based by-products emanating from fresh fish to improve the effectiveness and sustainability of marines and fisheries in its updated Nationally Determined Contribution. [28]

The **UK** has committed GBP 43 million (USD 50 million) through its Ocean-Country Partnership Programme to support the strengthening of local marine scientific expertise in developing coastal countries, including the development of the skills and expertise needed to adopt sustainable seafood practices as one of its core objectives.

Australia is investing AUD 70 million (USD 45 million) in the Blue Economy Cooperative Research Centre to bring together expertise in aquaculture, marine renewable energy and marine engineering as part of a collaborative effort between industry, researchers and the community to develop innovative and sustainable offshore industries to increase Australian seafood and marine renewable energy production. [29]

Norway has established a social mission on sustainable feed that will be further developed and implemented in 2023. This cross sectorial project aims for all feed for farmed fish and livestock to come from sustainable sources, thus contributing to the reduction of GHG emissions in the food systems.

Priorities for further action: Reduce the emissions intensity of fisheries and aquaculture operations through optimising wild catch and shifting to low carbon feed options. Shift diets toward low carbon marine sources such as sustainably harvested fish, seaweed, and kelp as a replacement for emissions intensive land-based sources of protein.



Advance Research on Ocean-based Carbon Capture and Storage

The IPCC has stated that Carbon Capture and Storage (CCS) is a necessary part of the solution in order to reach the 1.5°C target. Storage of carbon in the seabed has enormous potential to divert carbon from the atmosphere, but it currently faces significant technical, economic, and socio-political challenges (e.g., environmental safety) that must be adequately explored prior to deployment at the scale necessary. However, there are several promising projects underway.

Safely storing carbon in the seabed could result in as much as 2 $GtCO_2e$ reduced per year by 2050. [30]

Examples of Ocean Panel action:

Norway has committed approximately NOK 18 billion (USD 1.8 billion) to the full-scale carbon capture and storage (CCS) project, Longship. This will be the first CCS project to integrate a complete value chain of individual CO_2 providers, a flexible cross-border transport solution including ship transport and third party access to infrastructure for CO_2 storage below the seabed. [31]

The **US** announced the Carbon Negative Shot in 2021 - an all-hands-on-deck call for innovation in technologies and approaches that will remove CO_2 from the atmosphere and durably store it at meaningful scales for less than USD 100/net metric ton of CO_2-equivalent (CO_2e).

Priorities for further action: Invest in the research necessary to understand and minimise environmental impacts of long-term storage of carbon in the seabed and regulatory and economic barriers. Monitor and assess promising CCS projects underway and ensure data is shared transparently and publicly.

Invest in Observation and Research

In addition to enhancing action towards each ocean-based climate solution, there is an urgent need for additional funding and support for integrated local-to-global observation and research to better inform decision-makers on the observed and projected impacts of climate change, warming and acidification on the ocean, and the role of the ocean in the global carbon cycle.

Examples of Ocean Panel action:

Portugal will launch the Atlantic Observatory in coordination with the International Research Center of the Atlantic (AIR Centre), including the Autonomous Regions of the Azores and Madeira, by the end of 2024. [32]

The **UK** supports the G7 Future of the Seas and Oceans Initiative (FSOI) to strengthen and sustain ocean observations, the UK hosted an International Digital Twin Ocean Summit (London, May 2022) with support from the G7 FSOI and the GEOMAR Helmholtz Centre for Ocean Research Kiel, towards transforming the way the ocean is studied, supporting better decision-making in the future.

Canada established the Canadian Integrated Ocean Observing System (CIOOS), providing up to CAD 1.5 million (USD 1.1 million) per year, to help tackle the issue of siloed ocean data and create a formal mechanism for efficient coordination and collaboration in Canada's ocean observing community, ultimately helping to predict and understand future trends in a changing ocean.

Mexico has established a one-of-a-kind ocean knowledge platform for the country to generate data and information on ocean-based activities and identify knowledge gaps and opportunities to address them. [33]

Japan launched the WebGIS service "MDA Situational Indication Linkages (MSIL)" to collect and share marine-related information and has allocated USD 1 million for the operation and improvement of MSIL. MSIL deals with 200+ kinds of marine-related information e.g. satellite-observed information, information of marine ecosystem (sea turtles spawning areas, marine mammals habitats and bird habitats), information of coastal nature (coral reefs, seaweed beds and mangrove forests) and information of legal areas (national parks and Ramsar wetlands). [34]

Australia has invested AUD 23.3 million (USD 15 million) in the Climate and Oceans Support Program for the Pacific (COSPPac) which supports Pacific island countries to monitor, analyse and communicate climate, ocean and sea level information to strengthen climate and disaster resilience. [35]

About the Ocean Panel

The High Level Panel for a Sustainable Ocean Economy (Ocean Panel) is a unique initiative by 17 world leaders who are building momentum for a sustainable ocean economy in which effective protection, sustainable production and equitable prosperity go hand in hand. By enhancing humanity's relationship with the ocean, bridging ocean health and wealth, working with diverse stakeholders and harnessing the latest knowledge, the Ocean Panel aims to facilitate a better and more resilient future for people and the planet.

Established in September 2018, the Ocean Panel has been working with government, business, financial institutions, the science community and civil society to catalyse and scale bold, pragmatic solutions across policy, governance, technology and finance to ultimately develop an action agenda for transitioning to a sustainable ocean economy. Co-chaired by Norway and Palau, the Ocean Panel is the only ocean policy body made up of serving world leaders with the authority needed to trigger, amplify and accelerate action worldwide for ocean priorities.

The Ocean Panel comprises members from Australia, Canada, Chile, Fiji, France, Ghana, Indonesia, Jamaica, Japan, Kenya, Mexico, Namibia, Norway, Palau, Portugal, the United Kingdom and the United States and is supported by the UN Secretary-General's Special Envoy for the Ocean. The Secretariat, based at World Resources Institute, supports with analytical work, communications and stakeholder engagement.

For more information **www.oceanpanel.org**

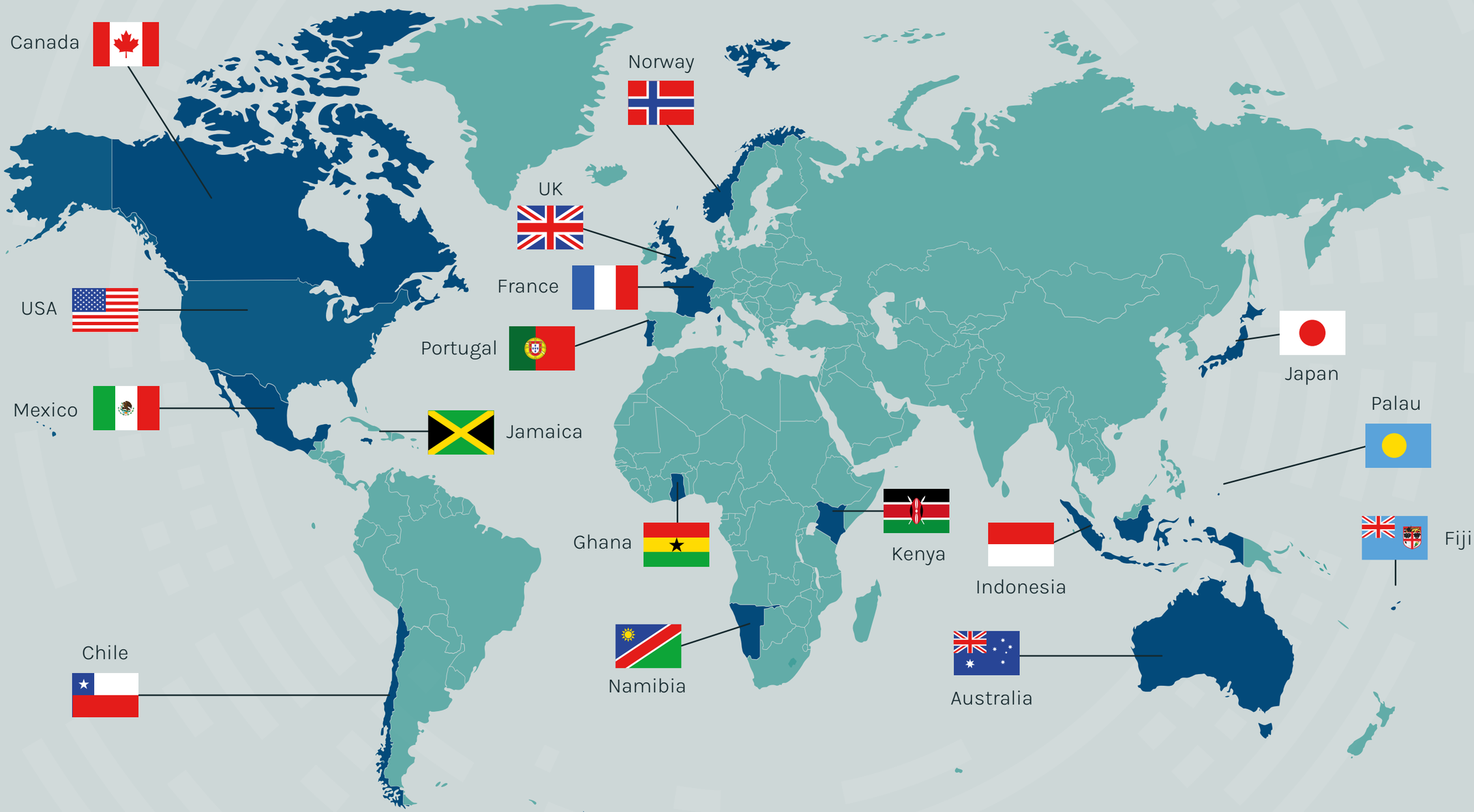
Countries across our blue planet are coming together for a sustainable ocean economy. Nations large and small, across all ocean basins, at every stage of economic development, at every extreme of the ocean environment from the tropics to the arctic. Ocean Panel countries account for approximately:

44% of global EEZs

26% of the world's fisheries

20% of the world's shipping fleet

50% of global coastlines



References and Notes

1. Hoegh-Guldberg. O., et al. 2019. “The Ocean as a Solution to Climate Change: Five Opportunities for Action.” Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate
2. Mcleod, E., G.L. Chmura, S. Bouillon, R. Salm, M. Björk, C.M. Duarte, C.E. Lovelock, et al. 2011. “A Blueprint for Blue Carbon: Toward an Improved Understanding of the Role of Vegetated Coastal Habitats in Sequestering CO2 .” Frontiers in Ecology and the Environment 9 (10): 552-60
3. Hoegh-Guldberg. O., et al. 2019. “The Ocean as a Solution to Climate Change: Five Opportunities for Action.” Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate
4. https://pm.gc.ca/en/news/news-releases/2022/03/29/delivering-clean-air-and-strong-economy-canadians
5. Mikoko Pamoja; https://www.mikokopamoja.org/
6. Hoegh-Guldberg. O., et al. 2019. “The Ocean as a Solution to Climate Change: Five Opportunities for Action.” Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate
7. Offshore Wind Biz, France to Build 50 Windfarms by 2050; https://www.offshorewind.biz/2022/02/11/macron-france-to-build-50-offshore-wind-farms-by-2050/
8. Government of UK, Offshore Wind Deal; https://www.gov.uk/government/publications/offshore-wind-sector-deal/offshore-wind-sector-deal
9. UNFCCC, Namibia’s Updated Nationally Determined Contribution; https://unfccc.int/sites/default/files/NDC/2022-06/Namibia%27s%20Updated%20NDC_%20FINAL%2025%20July%202021.pdf
10. Government of Canada, Canada Makes Historic Investments in Tidal Energy in Nova Scotia, 5 November 2020; https://www.canada.ca/en/natural-resources-canada/news/2020/11/canada-makes-historic-investments-in-tidal-energy-in-nova-scotia.html). The first platform grid was connected in Grand Passage in June 2022 and is now supplying power to Nova Scotia (https://www.sustainablemarine.com/press-releases/sustainable-marine-powers-up-tidal-energy-in-nova-scotia
11. UN Ocean Conference, 27 June 2022.
12. Government of Norway, Ambitious offshore wind initiative, 11 May 2022; https://www.regjeringen.no/en/aktuelt/ambitious-offshore-wind-power-initiative/id2912297/
13. Government of Australia, Minister for Climate Change and Energy, Unlocking the Power of Offshore Wind, 5 August 2022; https://minister.dcceew.gov.au/bowen/media-releases/unlocking-power-offshore-wind
14. Overview of the Vision for Offshore Wind Power Industry, 15 December 2020; https://www.meti.go.jp/shingikai/energy_environment/yojo_furyoku/pdf/002_02_e01_01.pdf.
15. Government of the United States, FACT SHEET: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs, 29 March 2021; https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/ FACT SHEET: Biden-Harris Administration Announces New Actions to Expand U.S. Offshore Wind Energy, 15 September 2022; https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/15/fact-sheet-biden-harris-administration-announces-new-actions-to-expand-u-s-offshore-wind-energy/
16. Hoegh-Guldberg. O., et al. 2019. “The Ocean as a Solution to Climate Change: Five Opportunities for Action.” Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate
17. Pacific Blue Shipping Partnership, 27 September 2019; https://www.igd.unsw.edu.au/tags/pacific-blue-shipping-partnership#:~:text=Five%20Pacific%20Countries%20Launch%20Partnership,Ocean%20zero%20carbon%20by%202050.
18. PRESS RELEASE: Chilean Ministries of Energy, Transport and Telecommunications, and Foreign Affairs, together with the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping launch joint project to establish green shipping corridors in Chile, 13 April 2022; https://cms.zerocarbonshipping.com/media/uploads/documents/Chilean-Green-Corridors-Network_2022.04.13.pdf
19. Government of the United States, FACT SHEET: President Biden’s Leaders Summit on Climate, 23 April 2021; https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/
20. Roadmap to Zero Emission from International Shipping, March 2020; https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Air%20pollution/Roadmap%20to%20Zero%20Emission%20from%20International%20Shipping%20-%20Japan%20March%202020.pdf
21. Government of Canada; https://tc.canada.ca/en/programs/clean-transportation-system-research-development-program-cts-rd-applicant-s-guide
22. Government of the United Kingdom, Clydebank Declaration; https://www.gov.uk/government/publications/cop-26-clydebank-declaration-for-green-shipping-corridors/cop-26-clydebank-declaration-for-green-shipping-corridors
23. Parker, R.W.R., J.L. Blanchard, C. Gardner, B.S. Green, K. Hartmann, P.H. Tyedmers, and R.A. Watson. 2018. “Fuel Use and Greenhouse Gas Emissions of World Fisheries.” Nature Climate Change 8: 333–37. https:// doi.org/10.1038/s41558-018-0117-x
24. Hoegh-Guldberg. O., et al. 2019. “The Ocean as a Solution to Climate Change: Five Opportunities for Action.” Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate
25. Government of Jamaica, 2022/2023 Estimates of Expenditure, 16 February 2022; https://jis.gov.jm/resilience-to-climate-change-being-enhanced-in-fishing-communities/
26. Tetra Tech, 27 August 2021; https://www.tetratech.com/en/projects/supporting-the-recovery-of-ghanas-small-pelagic-fisheries-sector
27. Ministerial Directive, 3 March 2022; https://sites.google.com/view/gef6palau/gef6-key-sectors/keledangercheled-food-security/year-of-keled-a-ngercheled
28. UNFCCC, Namibia’s Updated Nationally Determined Contribution; https://unfccc.int/sites/default/files/NDC/2022-06/Namibia%27s%20Updated%20NDC_%20FINAL%2025%20July%202021.pdf
29. Blue Economy Cooperative Research Centre; https://blueeconomycrc.com.au/
30. Hoegh-Guldberg. O., et al. 2019. “The Ocean as a Solution to Climate Change: Five Opportunities for Action.” Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate
31. CCS Norway, The Longship CCS Project, https://ccsnorway.com/the-project/
32. UN Ocean Conference, 27 June 2022.
33. Ocean Panel, Developing an Ocean Knowledge Platform; https://action.oceanpanel.org/initiative/mexico/developing-an-ocean-knowledge-platform/
34. MDA Situational Indication Linkages; https://www.msil.go.jp/msil/htm/topwindow.html
35. Government of Australia, Climate and Oceans Support Program in the Pacific; http://cosppac.bom.gov.au/