



Empowering the blue magic

Act today for tomorrow

April 2021



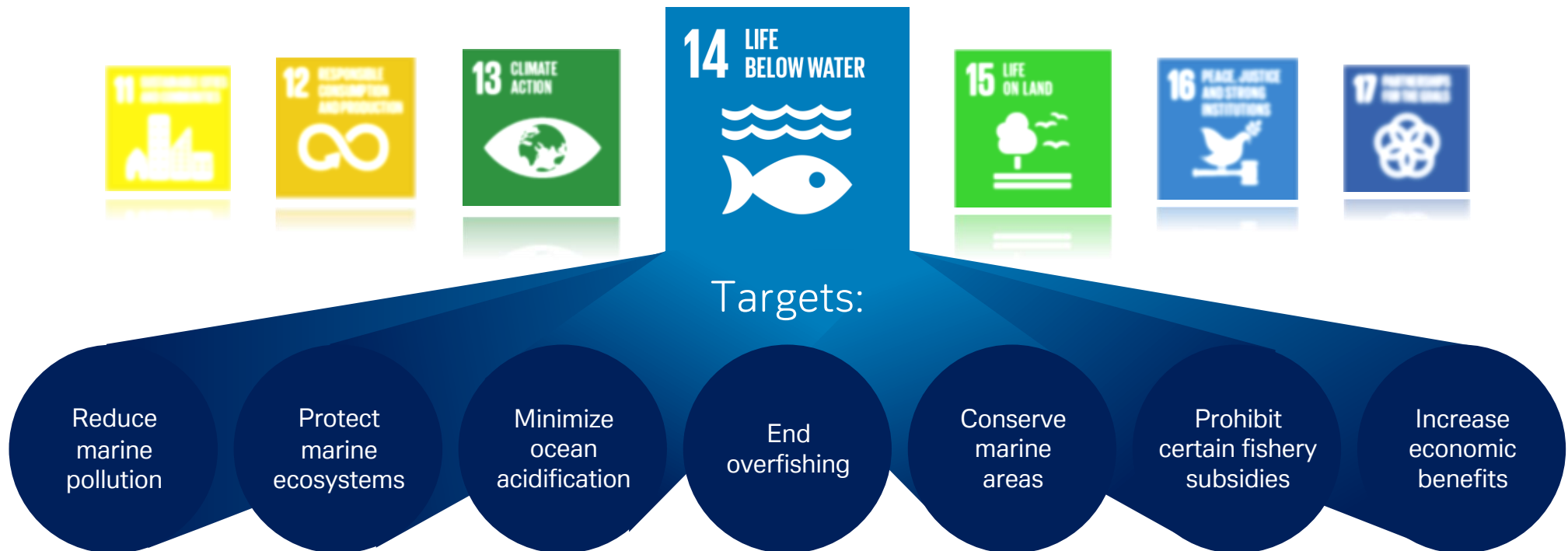


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Introduction to the blue economy

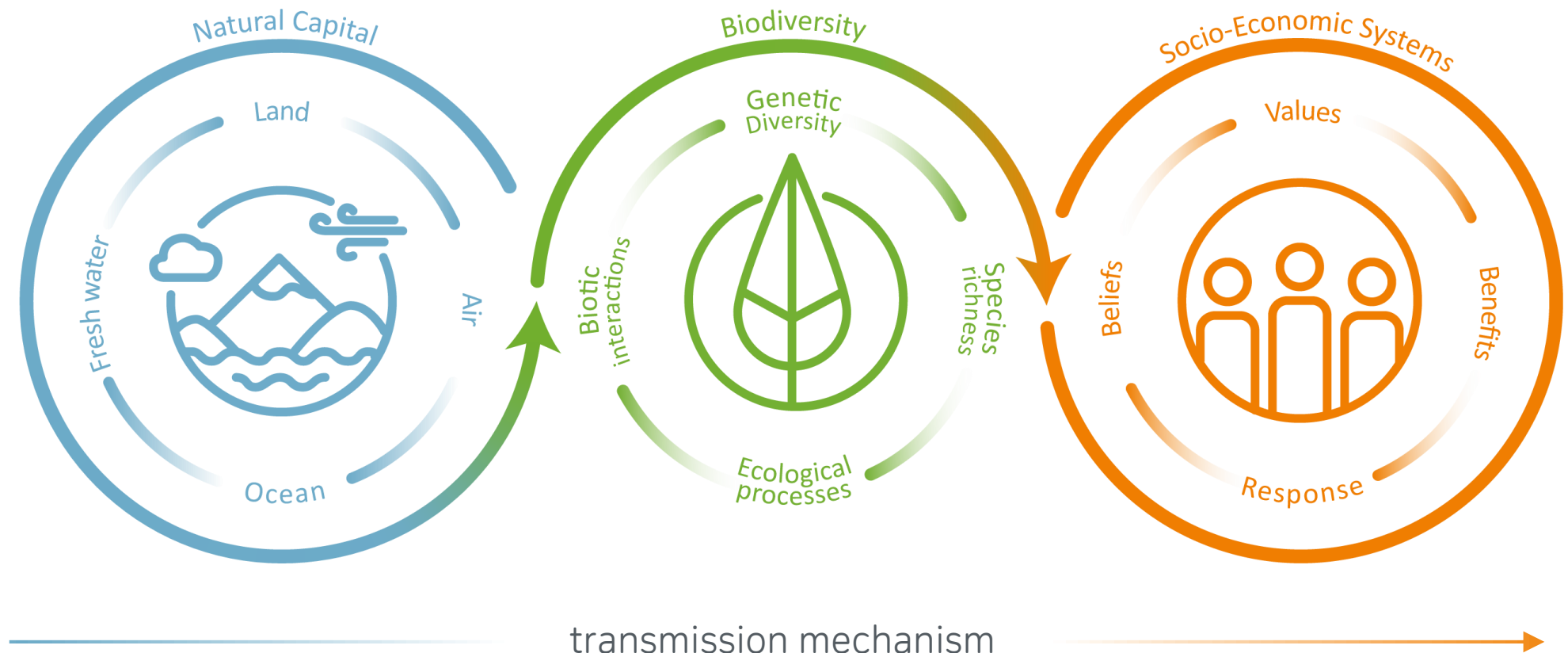


UN's Sustainable Development Goal 14



Source: United Nations, Deutsche Bank AG. As of December 1, 2020.

Ocean health is critical to biodiversity...



...which in turn is critical to society.

Source: European Commission, Erhard et al. (2016), Deutsche Bank AG. As of October 12, 2020.

Human activity is wrecking our oceans

At least

55%

of ocean area
is covered by
industrial fishing

33%

of fish stocks
are overfished

50%

of the world's coral reef
system has been destroyed

More than 85% of
wetlands have been lost

83% decline across
freshwater species

40% of all known
species shrink

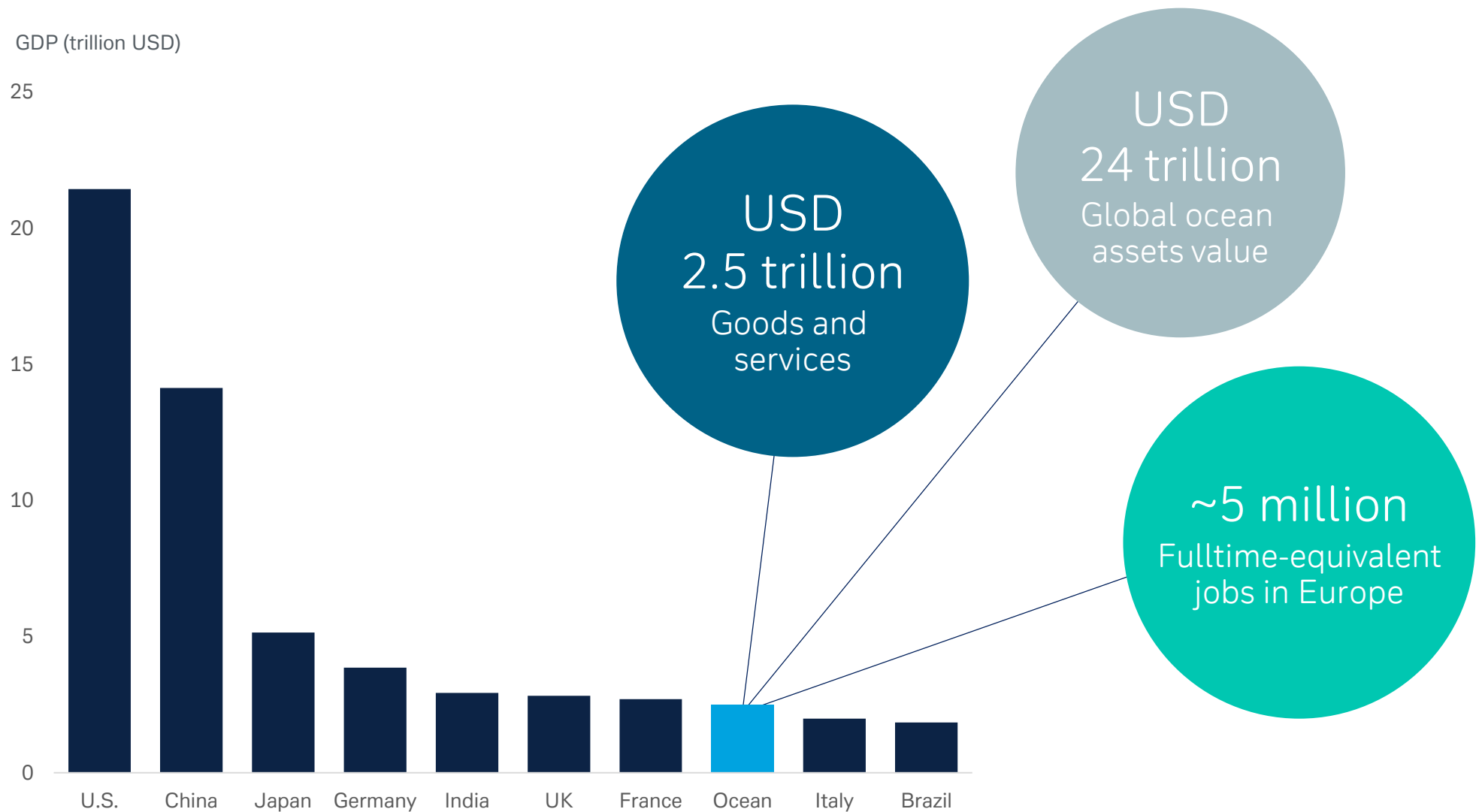
32% of worldwide forest
areas have been destroyed

Source: IPBES, WWF, Deutsche Bank AG. As of July 31, 2020.

The importance of the oceans



Oceans are the world's eighth largest economy

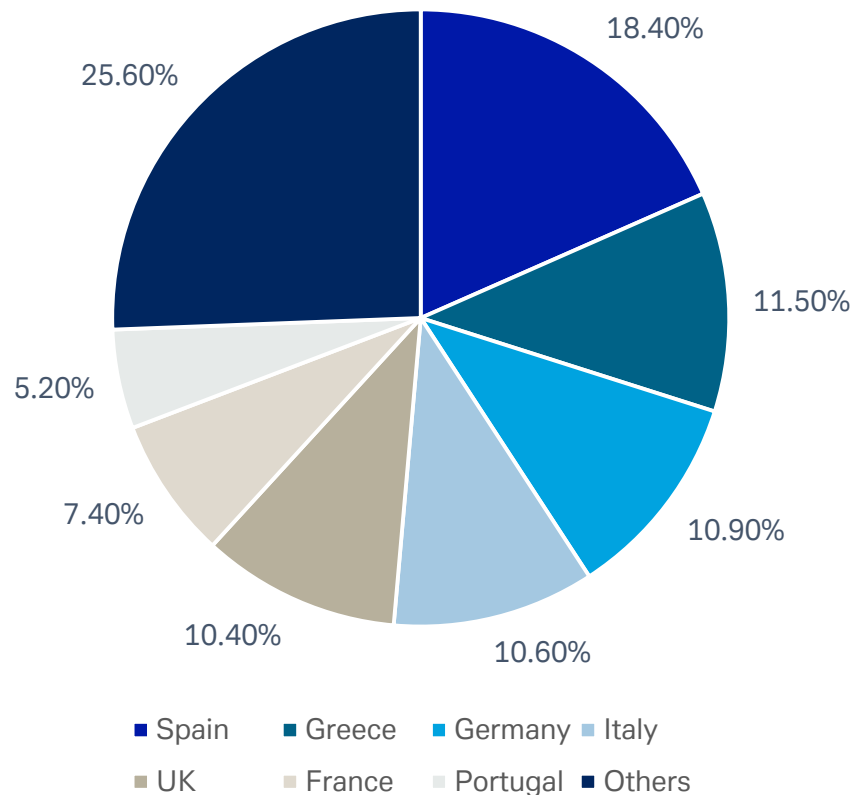


Source: IMF, WWF, OECD, Bloomberg, Destatis, Trading Economics, Deutsche Bank AG. As of October 2020.

Exploring the blue economy labour market

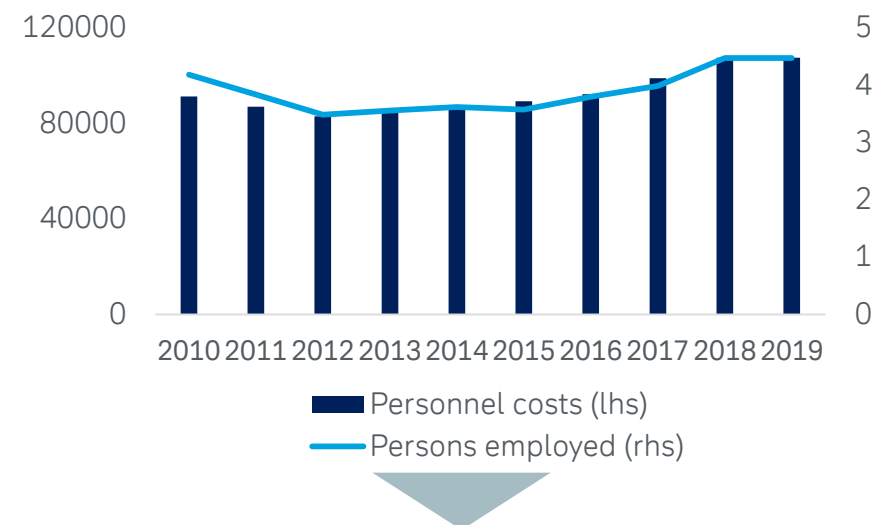
Persons employed

As % of total employment in the blue economy labour market in Europe



Personnel costs and persons employed

Costs in EUR million, employment in million



The Gross Value Added (GVA) per employee is estimated to be EUR53,900

Coastal tourism comprises the largest sector with 2.8 million employees (63.4%)

The highest personnel costs can be attributed to Spain with EUR20.9 million

The gross profit margin is around 12.3%, while the gross operating surplus is EUR94.3 million

Source: OECD, Deutsche Bank AG. As of July 30, 2020.

Oceans provide direct and indirect value



Source: IMF, WWF, OECD, Bloomberg, Destatis, Trading Economics, Deutsche Bank AG. As of October 2020.

Non economic benefits despite ocean sufferings



The air we breathe

The ocean stores 50 times more carbon dioxide than the atmosphere and produces over 50% of the world's oxygen



Climate regulation

Covering 71% of the Earth's surface, oceans absorb 93% of heat and regulate climate weather patterns



Transportation

More than 90% of international commerce (by volume) is nowadays transported by sea



Recreation

The ocean provides many unique activities (e.g. kayaking, scuba diving, etc.)



Food

3 billion people in the world rely on wild-caught and farmed seafood as a primary source of protein



Medicine

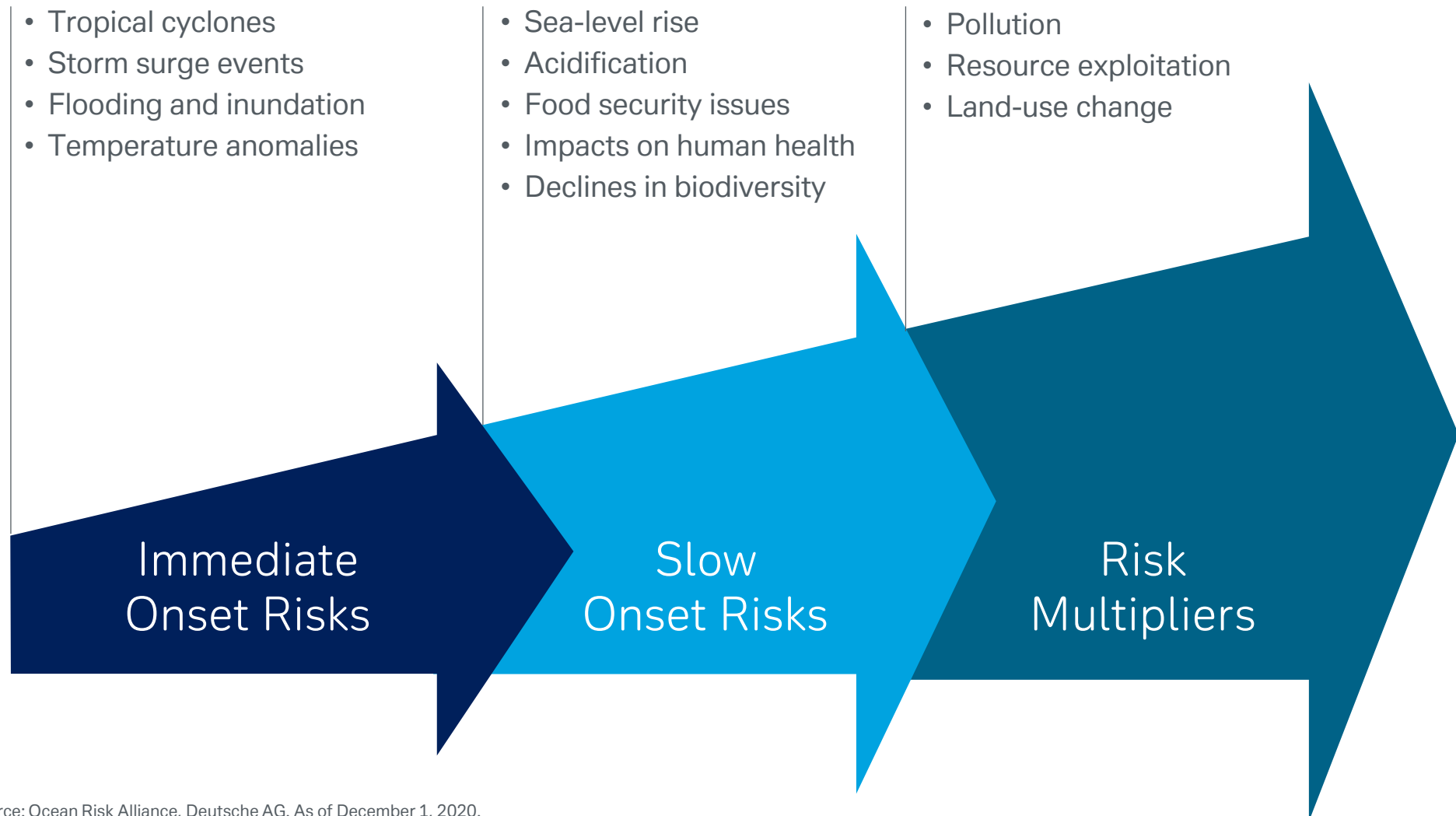
Oceans provide ingredients for many medicinal products

Source: European Commission, Deutsche Bank AG. As of October 12, 2020.

Risks to and from the oceans



Global risks stemming from our oceans

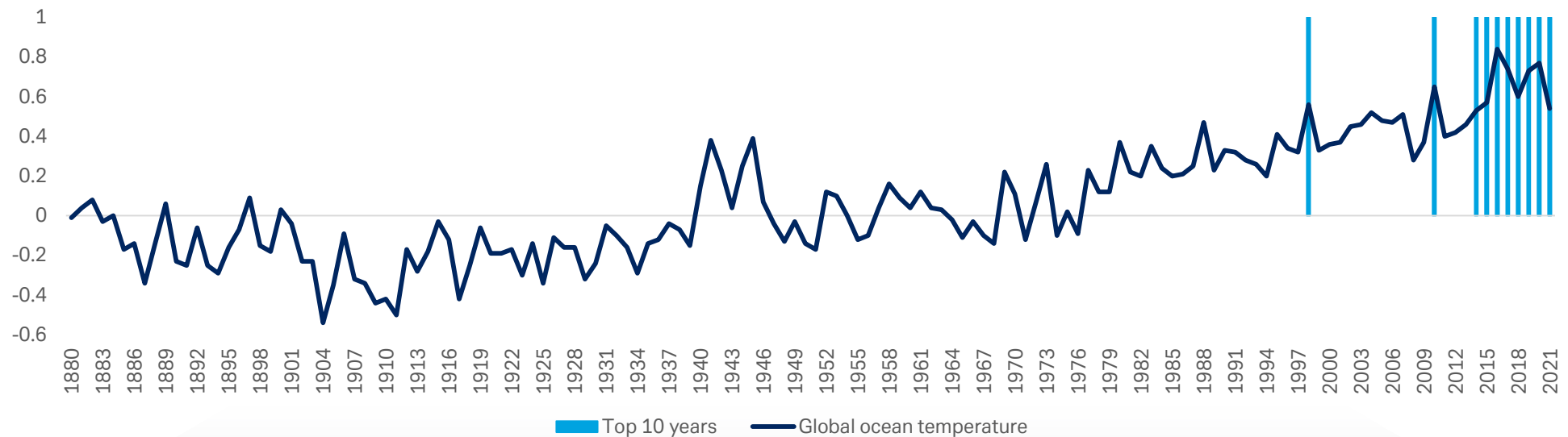


Source: Ocean Risk Alliance, Deutsche AG. As of December 1, 2020.

Oceans are getting warmer

Ocean surface temperature anomalies

In degrees Celsius (°C)



Global ocean surface temperatures were **0.76 degrees Celsius higher** in 2020 than that century's average

Oceans contain **93% of the heat** from human induced global warming

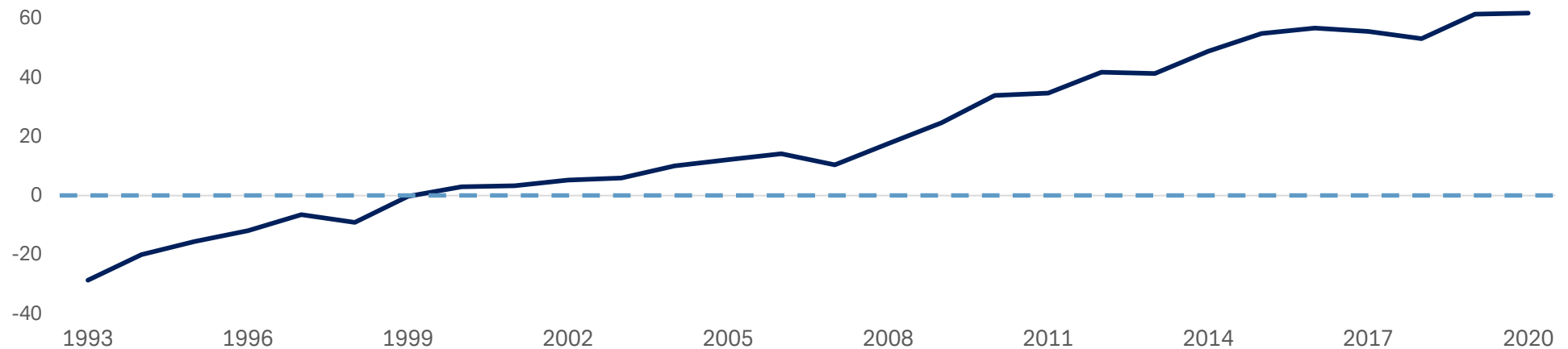
Extreme weather events will increase by continuing global warming through higher strength, frequency, spatial extent, and duration

Source: NOAA, NASA, Deutsche AG. As of March 25, 2021.

Sea level matters like never before

The largest impact for sea level rise is due to melting

Change in sea level (mm) compared to the 1993-2008 average



The pace of global sea level rise more than doubled to above 3.6 millimetres per year

Sea level has risen over 20 centimetres in some ocean basins since 1993

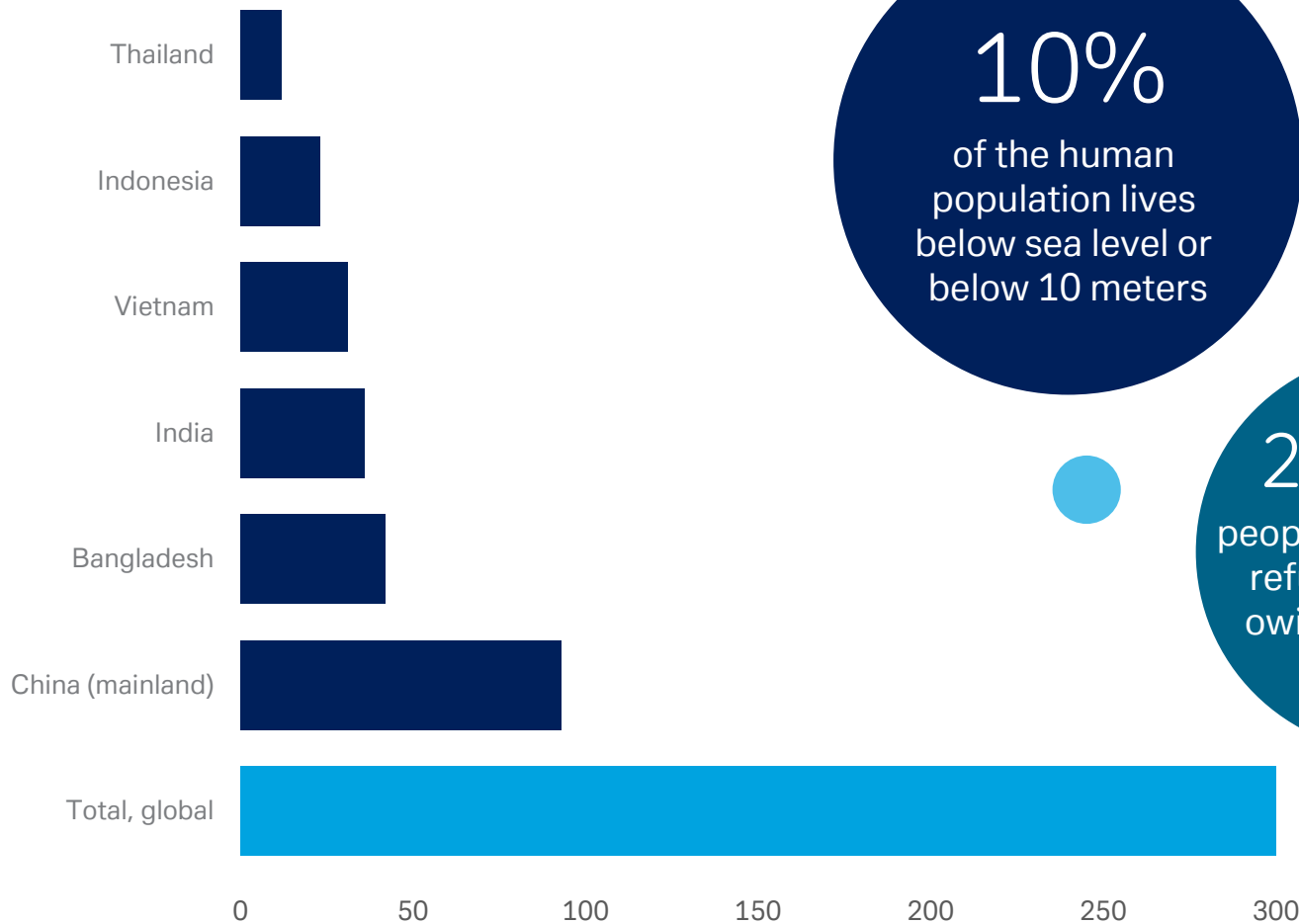
Global mean sea level is likely to rise at least 0.3 meters above 2000 levels by the end of the century

Source: NOAA, Deutsche AG. As of January 25, 2021.

Rising sea levels will be very disruptive

Population below the elevation of an average annual flood in 2050

Population (million)



10%
of the human
population lives
below sea level or
below 10 meters

300 million
people on land will be
disrupted by sea-level
rises by 2050

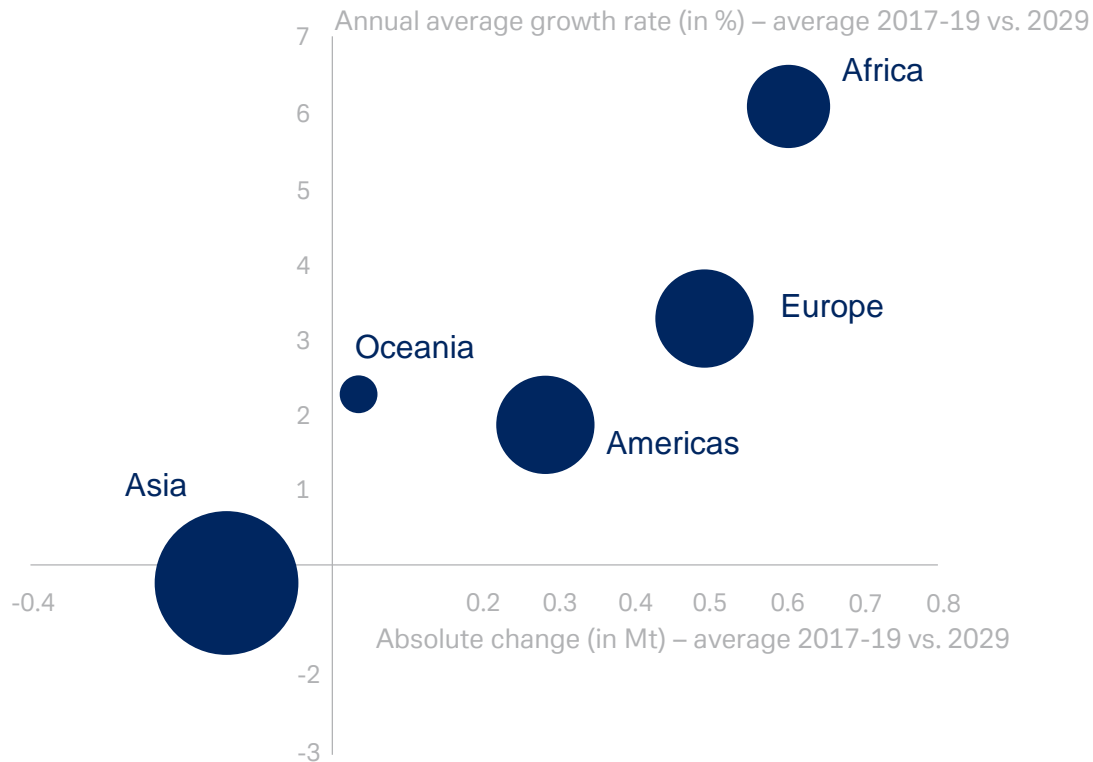
8 of 10
world's largest cities
are near a coast

2 billion
people could become
refugees by 2100
owing to sea-level
rises

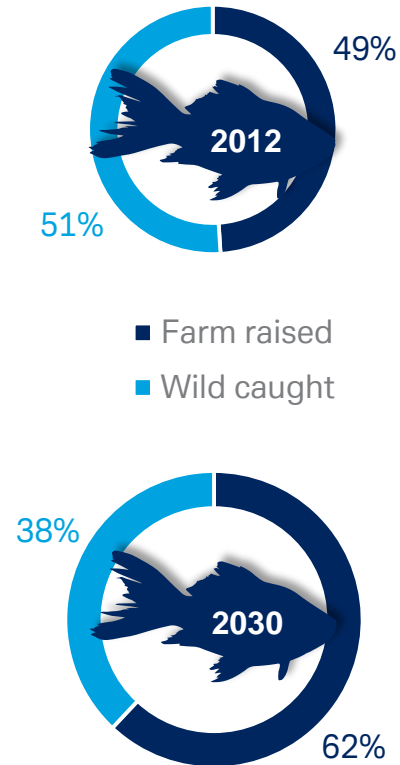
Source: Asia Development Bank, NOAA, IUCN, NASA, Deutsche AG. As of October 8, 2020.

Global seafood consumption on a high

Growth in world capture fisheries production by continent



Global seafood consumption



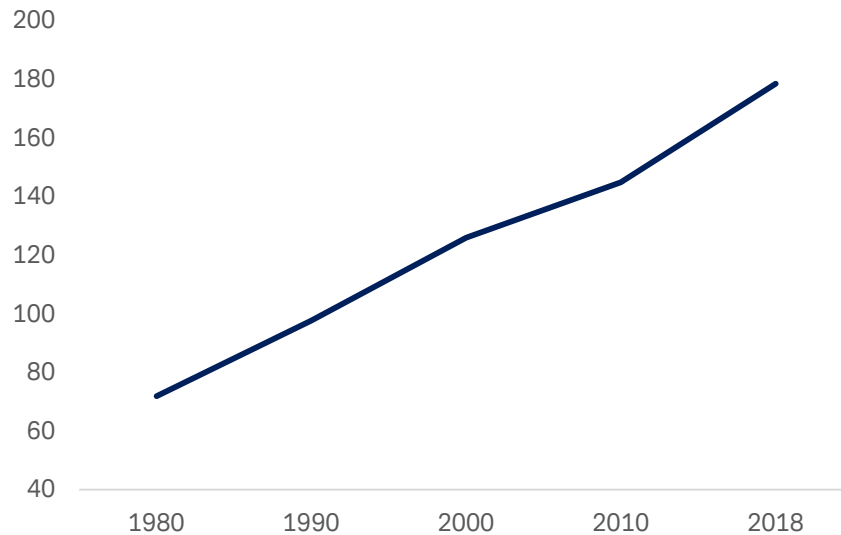
90% of fish production will be consumed as **food** and the **human consumption** is projected to reach **180Mt** by 2029 – an increase by 16.3%. Thereby, **Asia will account for 75%** of the additional amount of fish consumed

Footnote: The size of the bubble represents the average capture production (Mt) in 2017-19. Source: OECD, Deutsche Bank AG: As of 2020.

Overfishing takes new dimensions

World fish production

Million tonnes



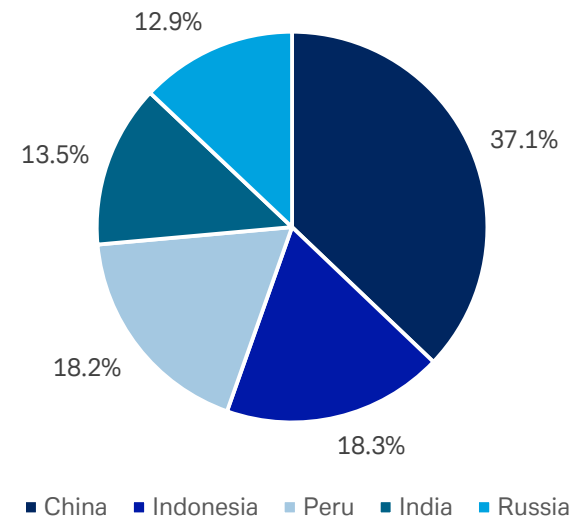
World fish production rose by **148%** from 1990 with a **CAGR of 2.42%**

Illegal, unregulated and unreported (IUU) fishing amounts to more than **80%** of the world's fishing areas

Source: FOA, WWF, Deutsche Bank AG. As of April 8, 2021.

Breakdown of Top 5 fishing countries

By capture production (in %)



Top 5 fishing countries account to **40.9%** of the global capture

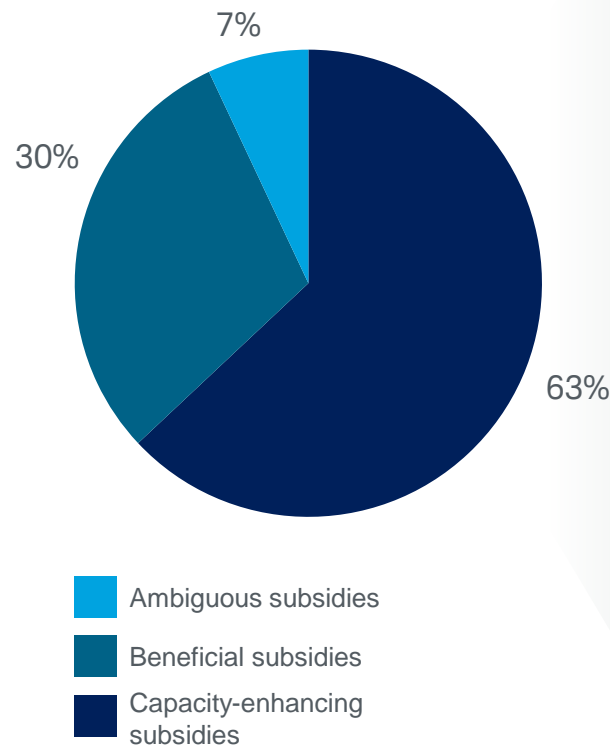
The capture production in the U.S. accounts for **4.9%** of the global production, while catching **17x** more than Germany

Subsidies can be harmful

Governments offer fishers subsidies to provide stability by guaranteeing a steady income and supply stream

Transfers to the fishing sector have economy-wide effects and create unfair competitive advantage

SDG 14.6 prohibits certain forms of fisheries subsidies which contribute to overcapacity and overfishing



Asia

including China, is by far the greatest subsidising region (55% of the total)

USD35.4bn

were provided as subsidies by public entities in 2018

Capacity-enhancing subsidies is the most directly linked to

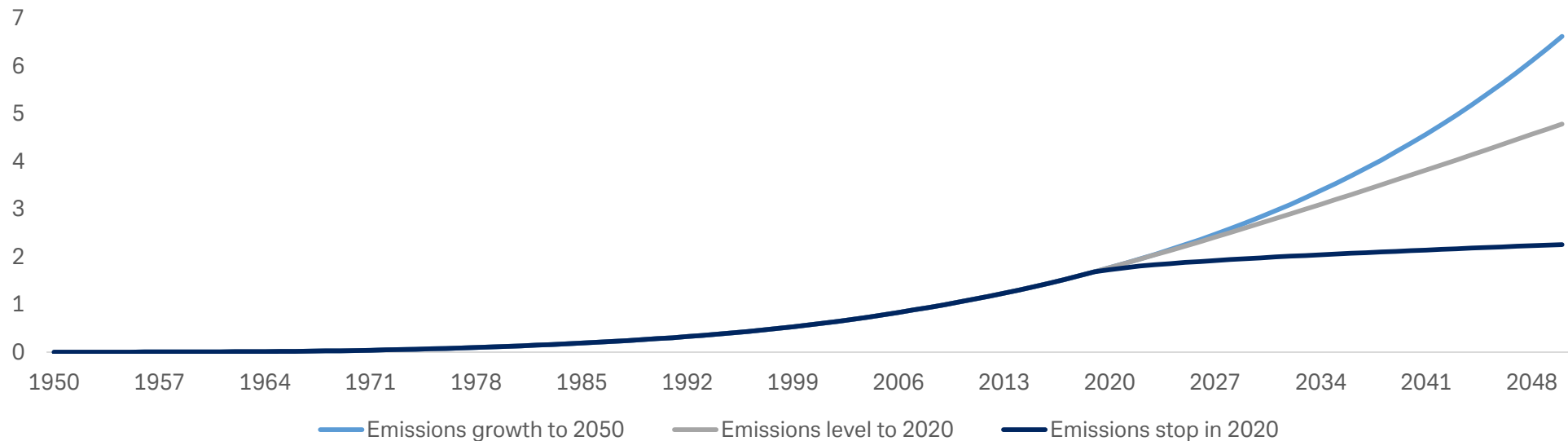
overfishing

Source: Sumaila et al. (2019), Schuhbauer et al. (2017), PEW, SDSN, Deutsche Bank AG. As of October 8, 2020.

Never ending plastic pollution

Macroplastics in the surface ocean

In million tonnes



8 million tonnes of plastic is inputted to the oceans per year

36%

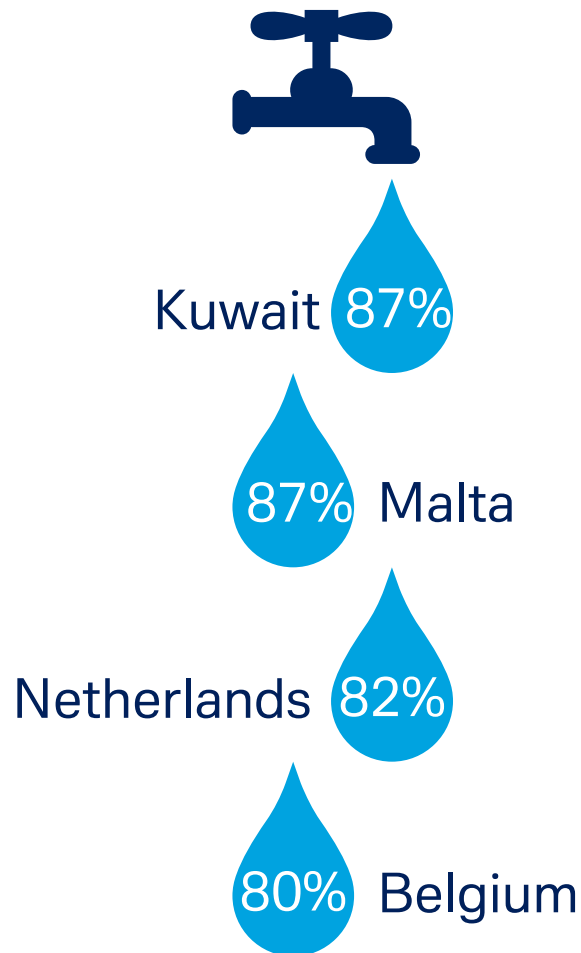
of global plastic waste stems from coastal plastic waste

It takes up to 480 years to break down the plastic in the ocean

Source: Our World in Data, Ocean Unite, Deutsche Bank AG. As of March 2021.

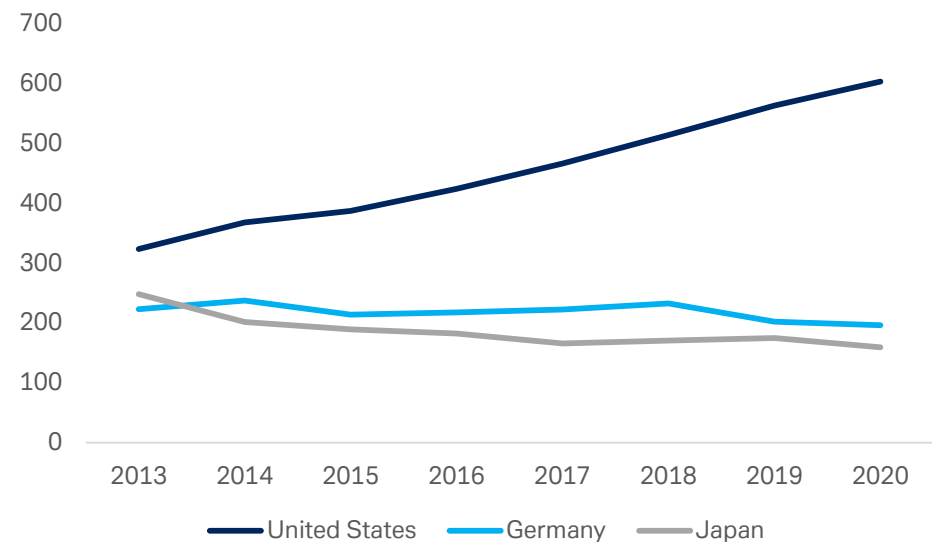
Water stress and scarcity on the forefront

Countries most dependent on water imports



Import trends of Top 3 importers of mineral water

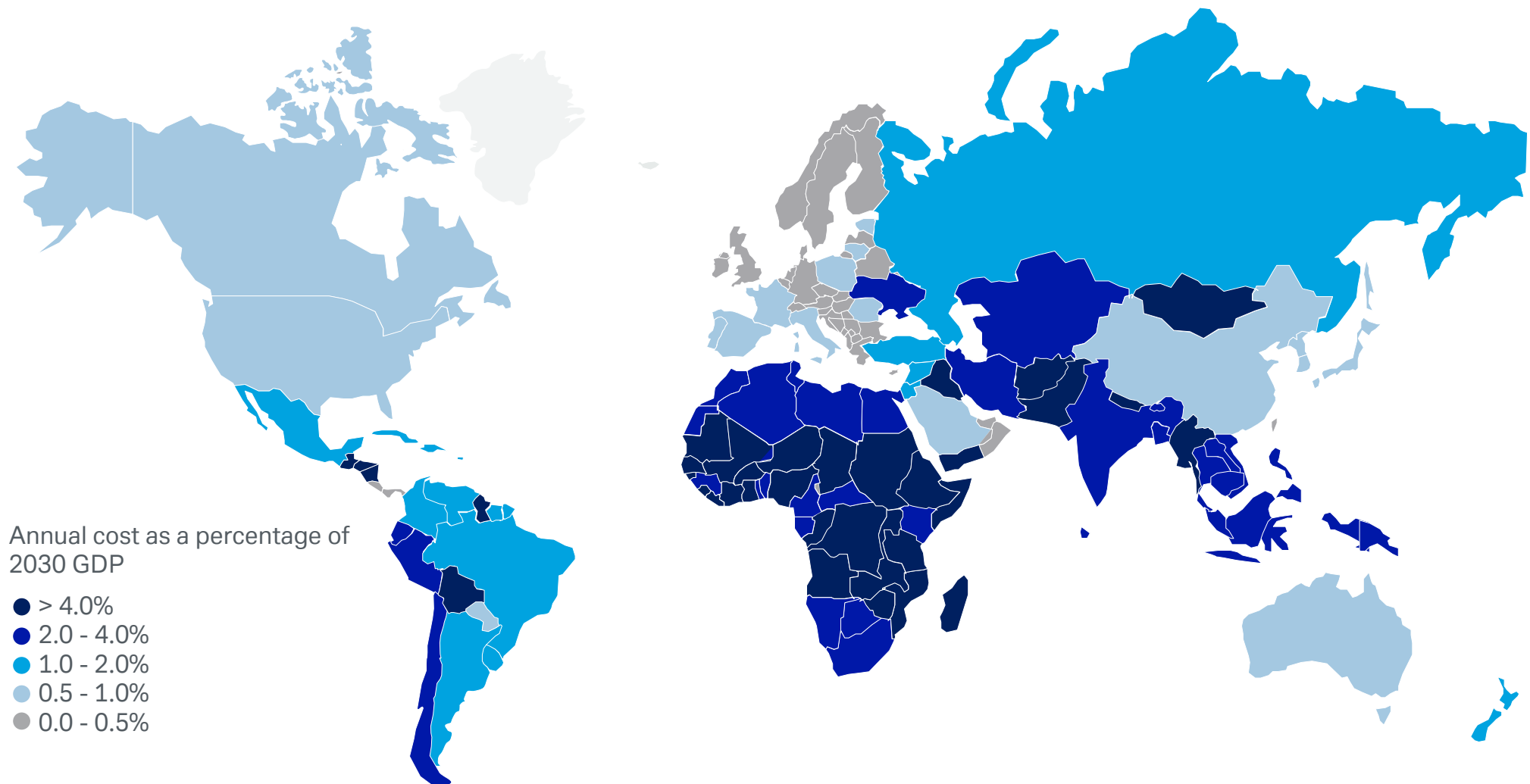
USD per metric ton



More than **2.8 billion** people in **48 countries** will face water stress or scarcity by 2025 – reaching **7 billion** by the middle of the century

Source: WWF, Tridge, Deutsche Bank AG. As of March 2021.

National costs of sustainable water highest in less developed countries



Source: World Resource Institute, Deutsche Bank AG. As of January 2020.

Investments and opportunities



Insufficient and yet extremely important



Source: Alvarado-Quesada et al. (2014), Stockholm Environment Institute, OECD, Deutsche Bank AG. As of April 8, 2021.

Governancing a prudent market mechanism

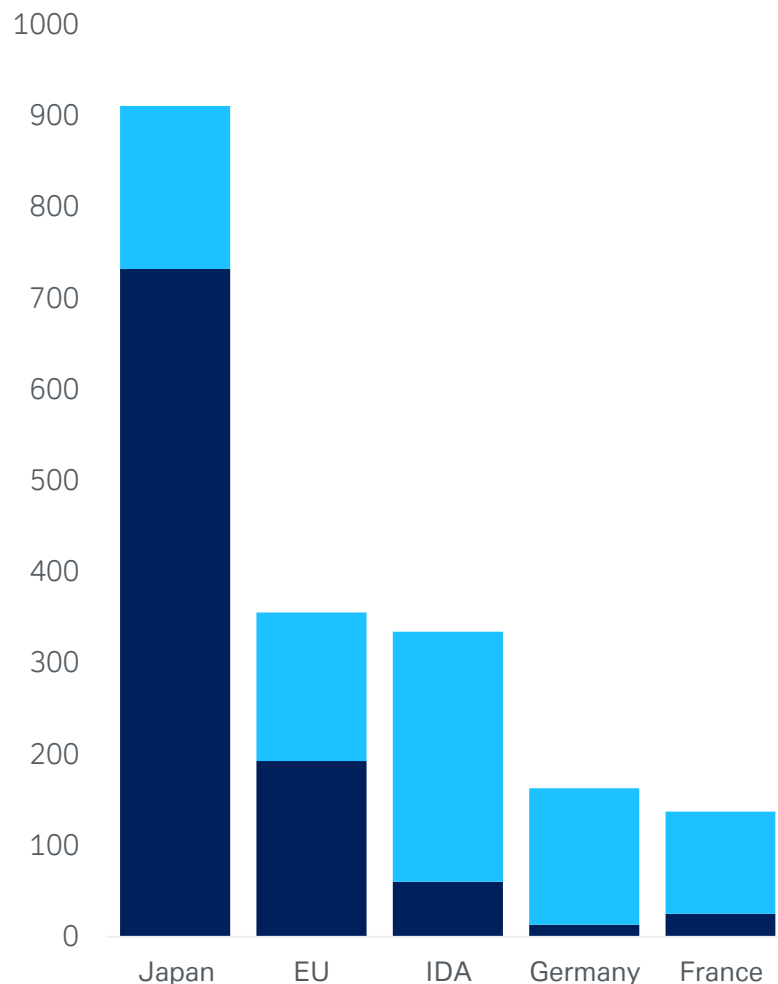


Source: UN Global Compact, Deutsche Bank AG: As of March 29, 2021.

Official development aid (ODA) is growing

Top 5 providers of development aid

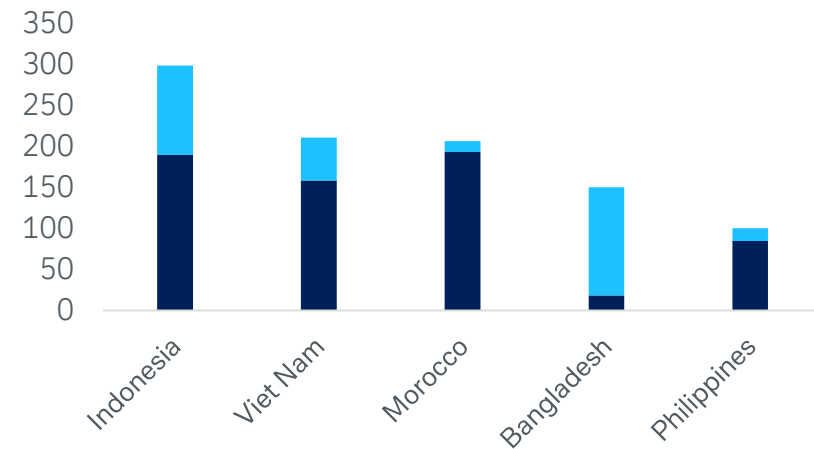
USD billion, constant 2017 prices



Source: OECD, Deutsche Bank AG. As of November 30, 2020.

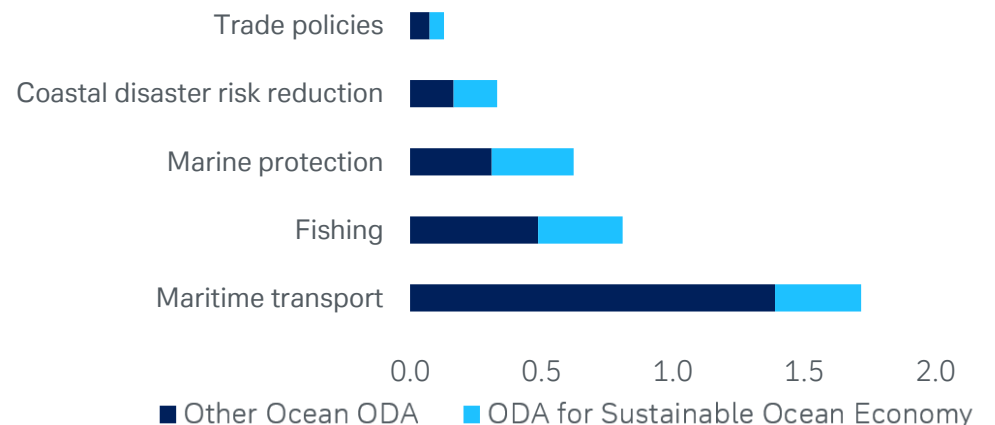
Top 5 recipients of development aid

USD billion, constant 2017 prices



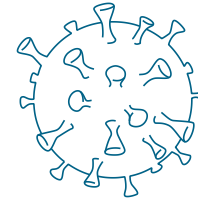
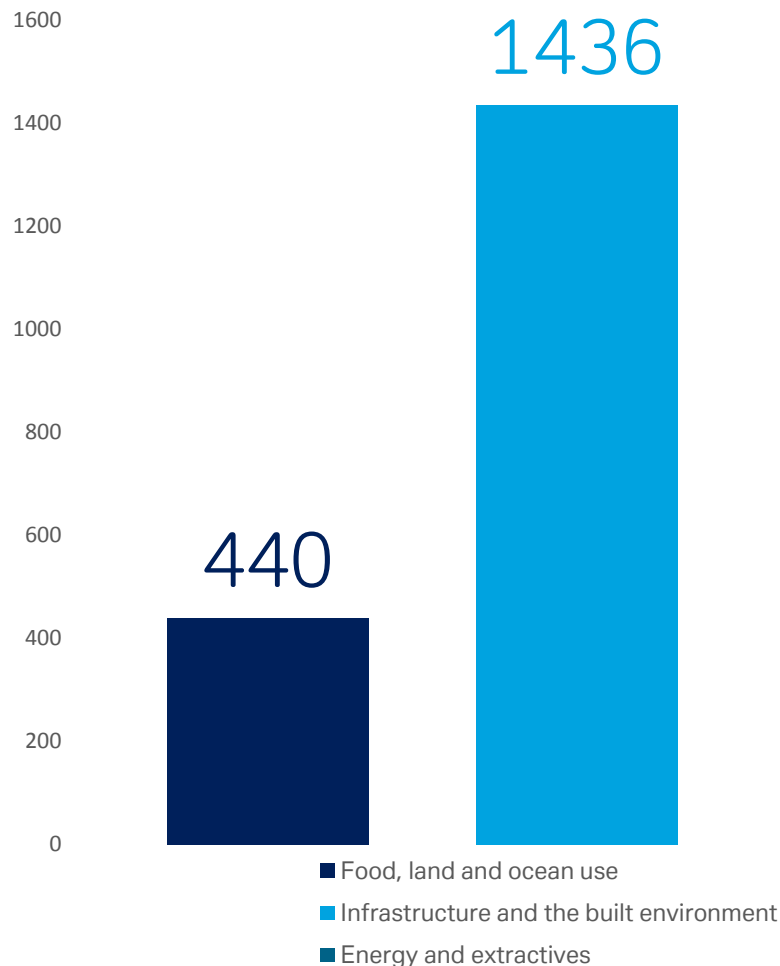
Top 5 target sectors of development aid

USD billion, constant 2017 prices

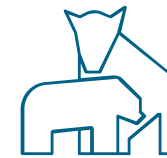


Capital is necessary for sustainable growth

Annualized investment costs (in USD billion, 2019 values)



Capital demand is smaller than, for example, the **USD1.9trn** stimulus package in the U.S. in response to COVID-19 (passed in March 2021)



Funds dealing with “blue economy” issues are **growing**



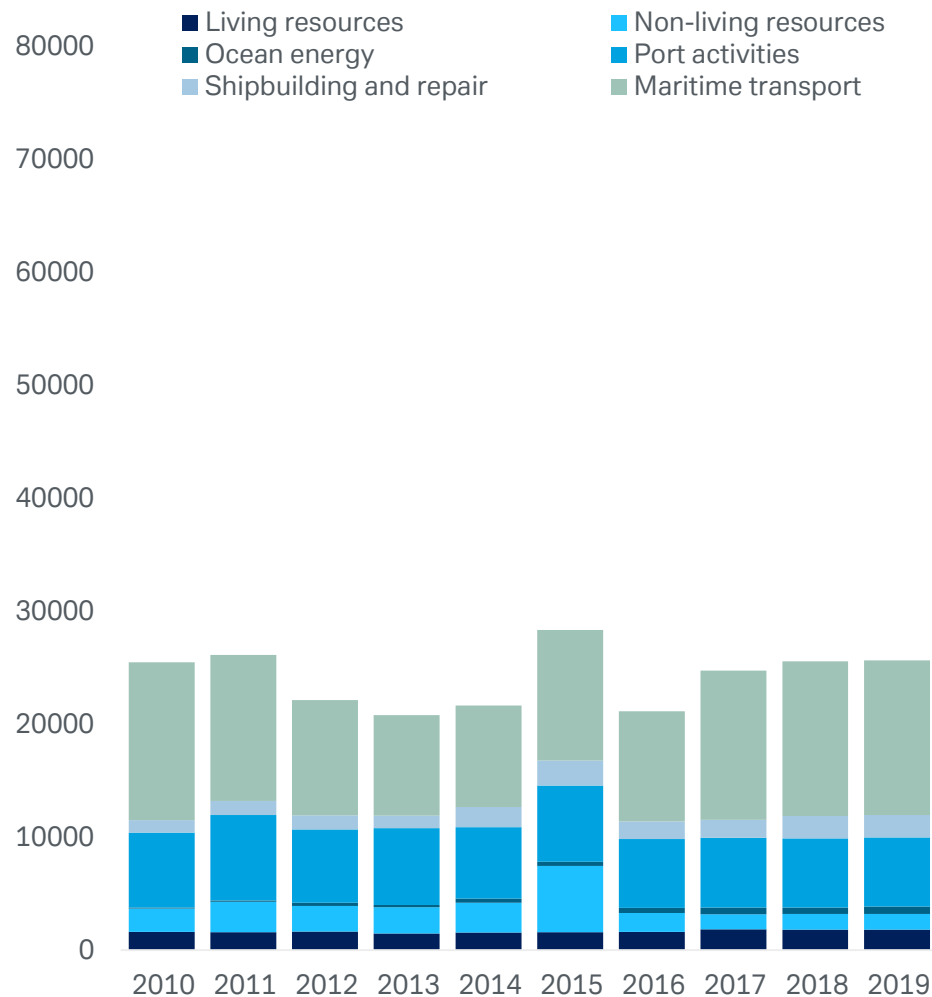
Long-term mechanisms for **market based** approaches have to be established

Source: Global Sustainable Investment Alliance, World Bank, Deutsche Bank AG. As of October 8, 2020.

Investments must meet sustainability criteria

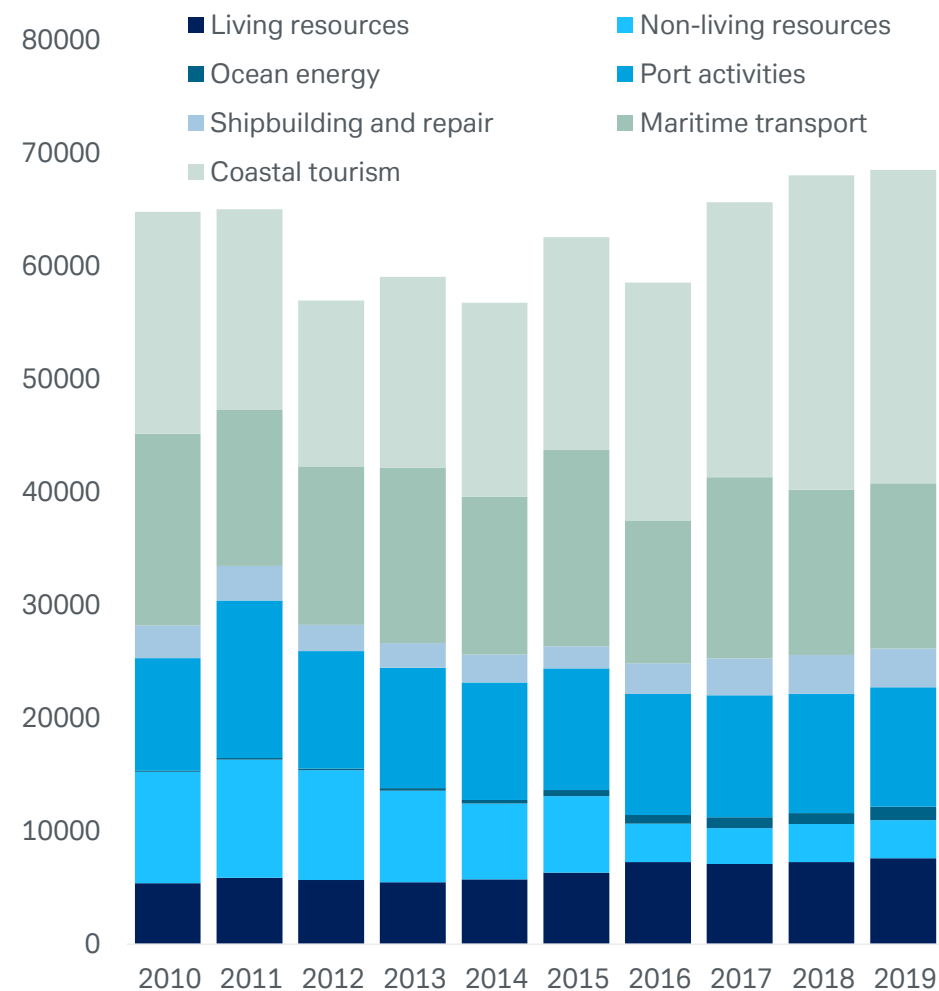
Gross investment by sector

EUR million



Gross operating surplus by sector

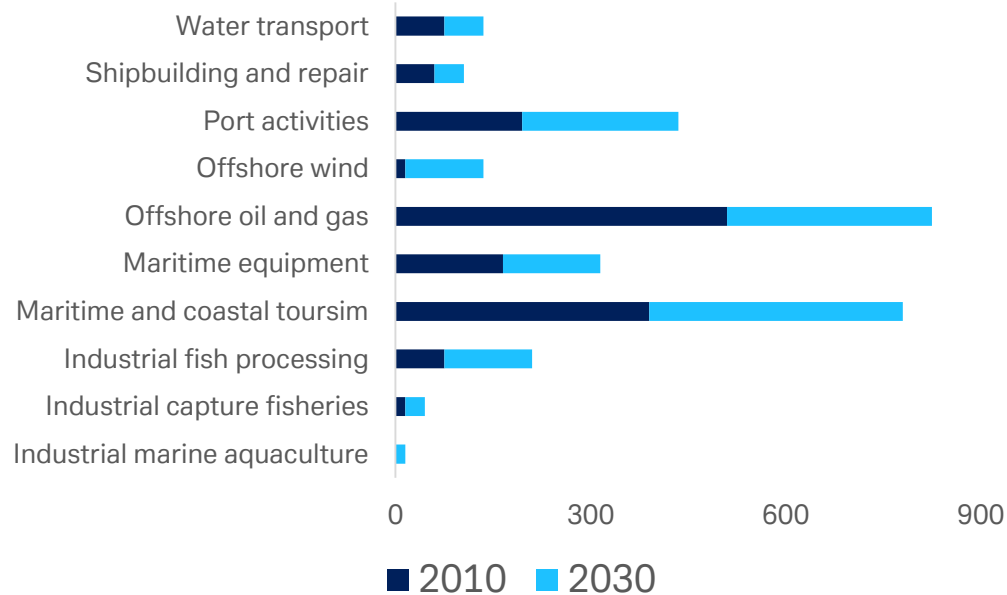
EUR million



Source: OECD, Deutsche Bank AG. As of July 30, 2020.

Sustainable treatment is crucial

USD billion



USD1.5trn
in 2010

USD3.0trn
in 2030



Failures in other areas of development in the past should not be repeated in the future.

Individual industries can indeed have a positive effect in the short term, but can cause serious damage to the blue economy in the long term.



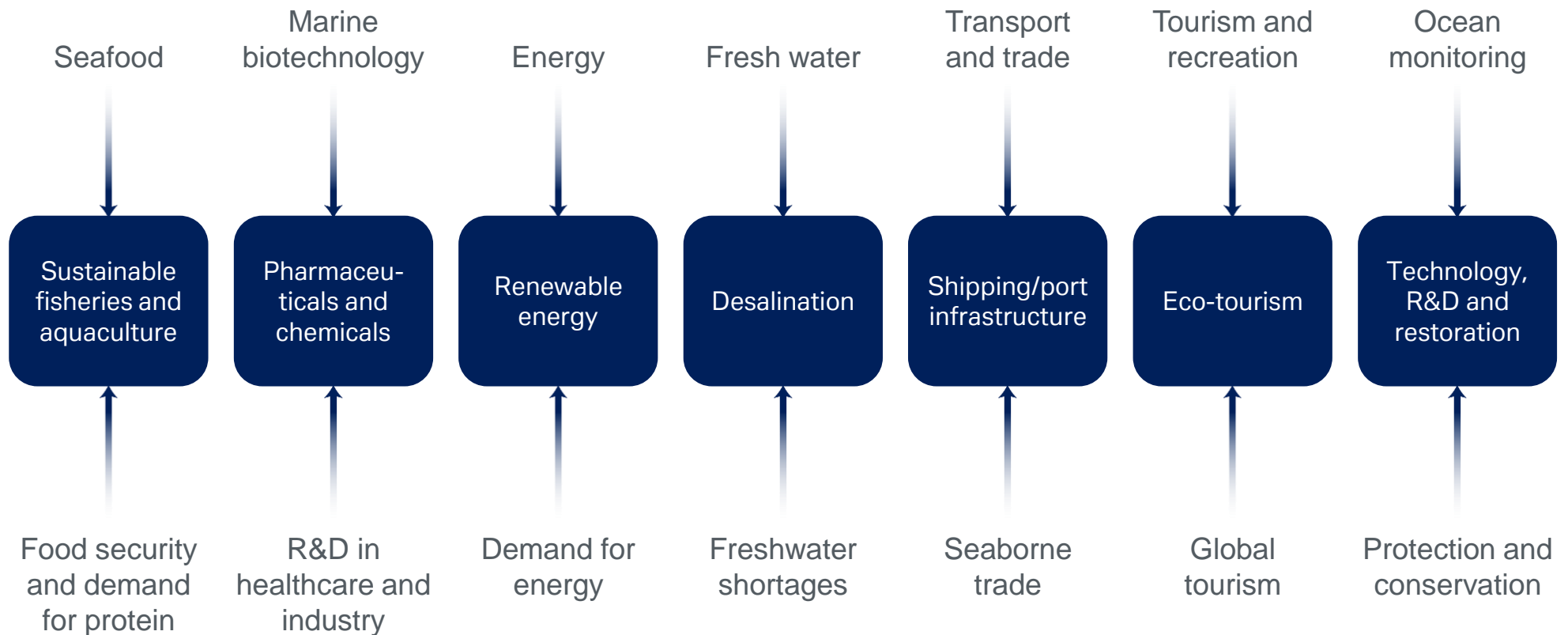
A careful and sustainable treatment of the oceans is indispensable.

Strengthening the visualization and verification of the strategic positioning of a company in the direction of environmental and climate protection.

Source: Niehörster, F. and R.J. Murnane (2018), Deutsche Bank Wealth AG. As of October 8, 2020.

Stronger focus on sustainability in business opportunities

Ocean services

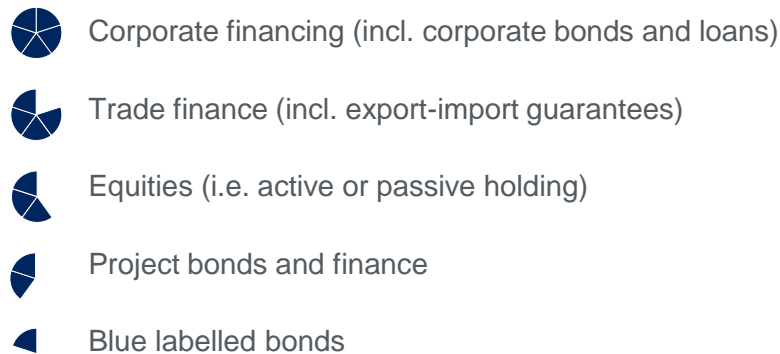


Growth drivers

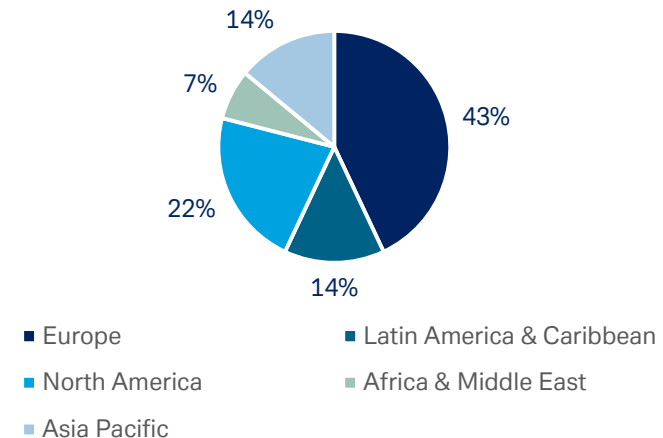
Source: Niehörster and Murnane (2018), Economist Intelligence Unit, Deutsche Bank AG. As of October 8, 2020.

The energy sector sets the pace

Top 5 financial instruments

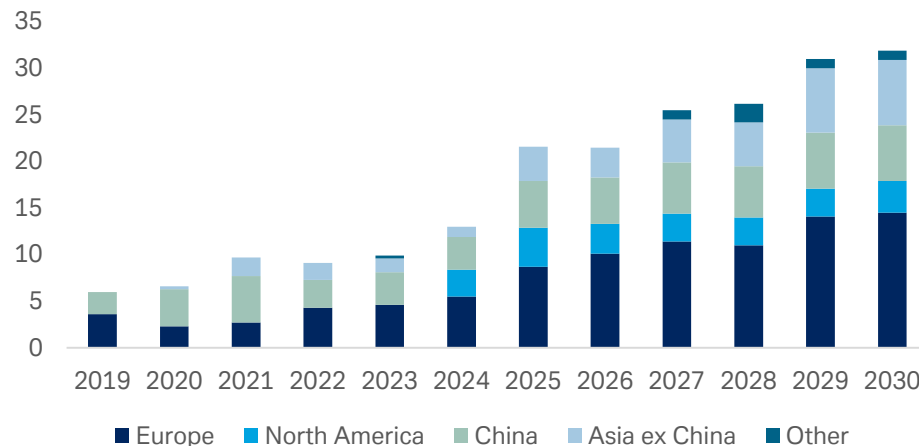


Marine renewable energy financing



Global offshore wind growth

Net installations in GW



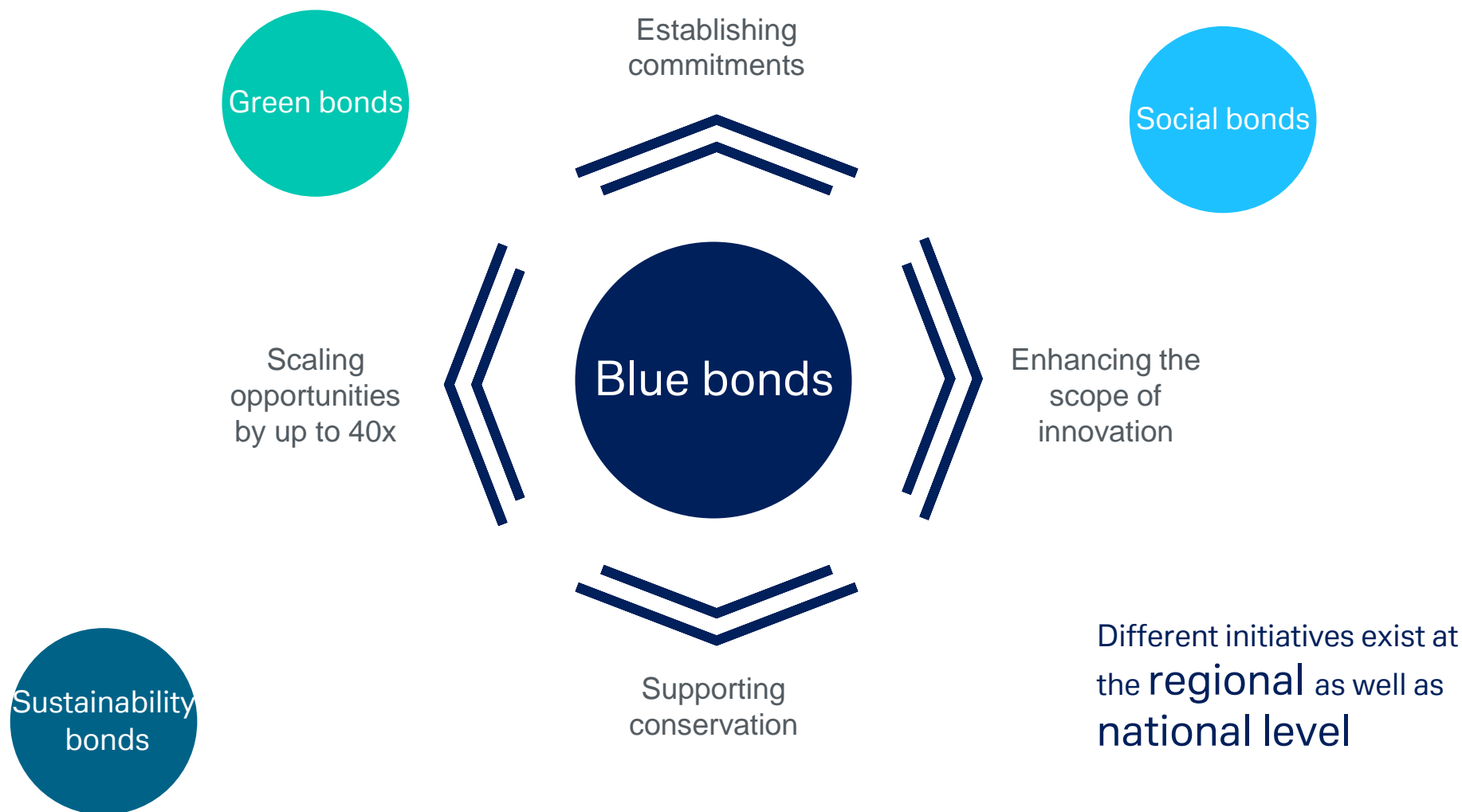
The average annual growth rate (CAGR) is 18.6% until 2024 and 8.2% to 2030

New annual installations will exceed the milestones of 20 GW in 2025 and 30 GW in 2030

Offshore wind will contribute for around 20% of total wind installations by 2025

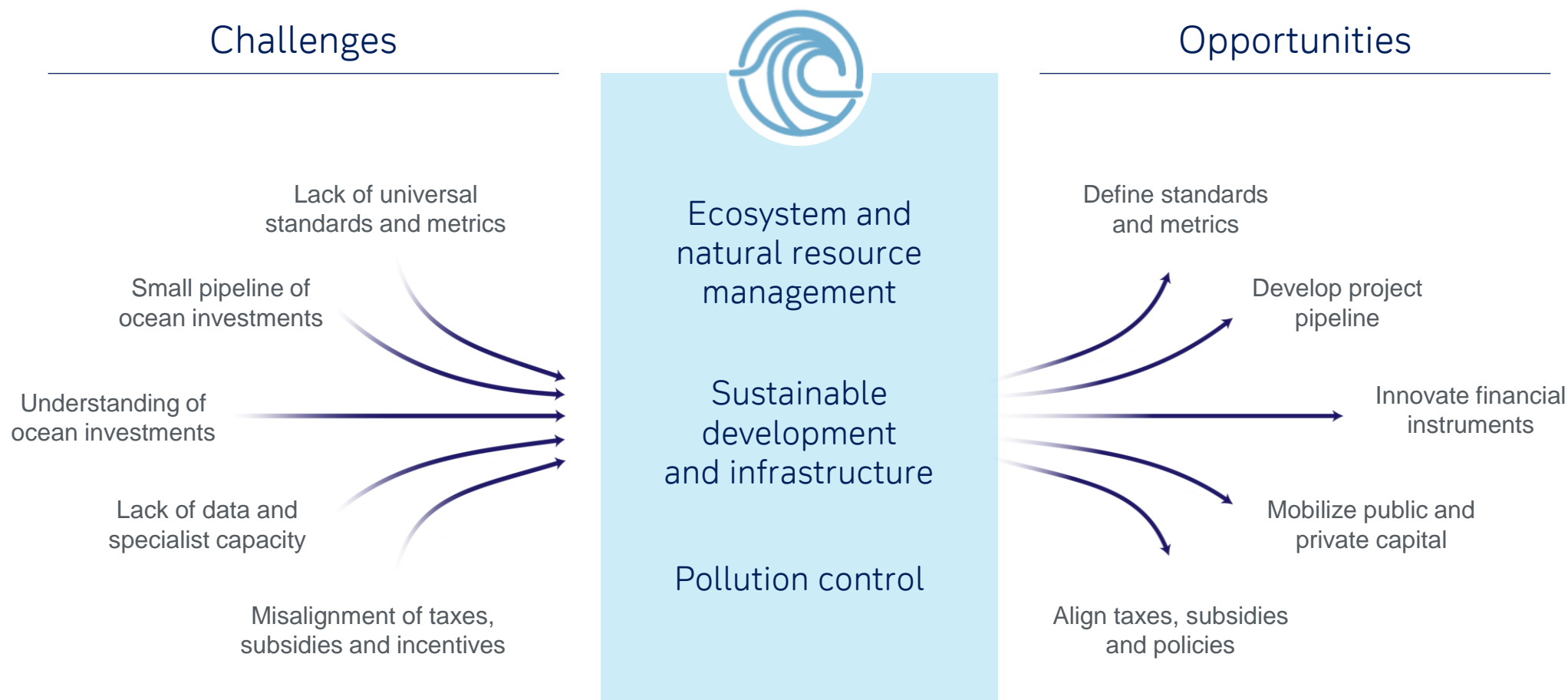
Source: UNEP FI, GWEC Market Intelligence, Deutsche Bank AG. As of March 2021.

Unlocking the blue growth



Footnote: The Nature Conservancy (TNC) expects to generate a 40x multiplier on initial investments from audacious and other donors.
Source: TNC, Deutsche Bank AG. As of March 4, 2021.

We must take action quickly



Source: Development Asia, Deutsche Bank AG. As of October 8, 2020.

The background of the slide is an underwater photograph. It shows the surface of the water at the top, with sunlight filtering through, creating a shimmering, dappled light effect. The water is a deep blue color, and the overall scene is serene and aquatic.

Conclusion

Act today for tomorrow

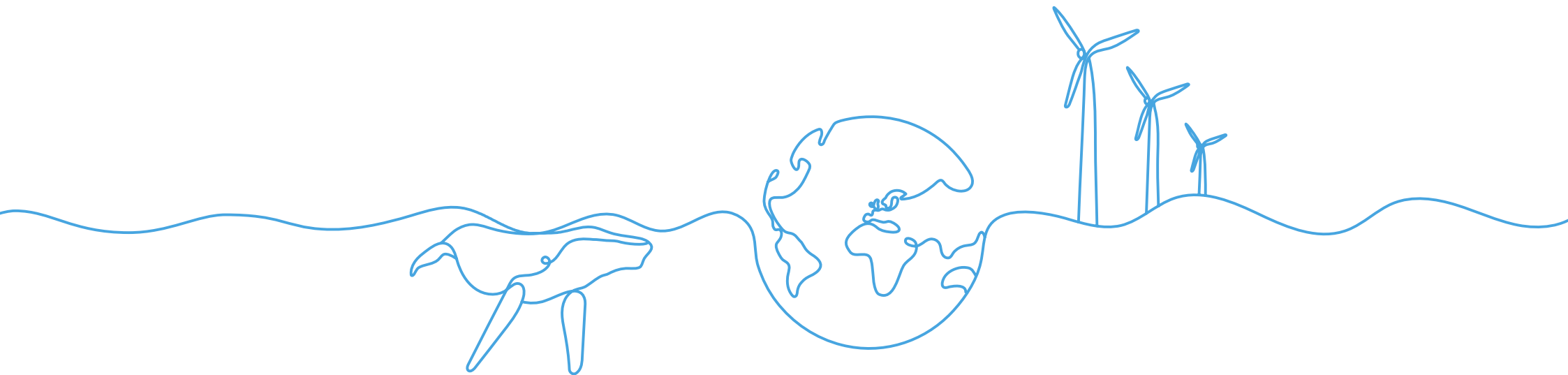
Recognize the **importance** of oceans

Gain **better understanding** and deep knowledge

Enhance **technology, governance** and **regulation**

Establish **long-term mechanisms** for market-based approaches

Invest carefully in oceans as a **new opportunity** for investment





Money spent on blue economy is not just a cost – the environmental pillar includes the most fundamental factors for human life and economic growth

ESG CIO content

CIO Specials on ESG



Act today to ensure the future – understanding ESG

November 2017



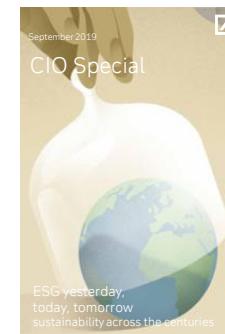
Making a positive impact – on financial performance and on society

April 2018



ESG Reflections – the 'E' in ESG

April 2019



ESG yesterday, today, tomorrow – Sustainability across the centuries

September 2019



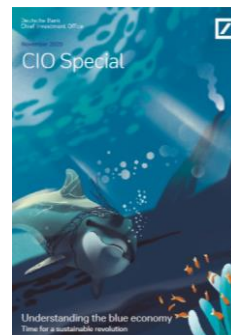
The 'S' in ESG – the ugly duckling of investing

November 2019



The 'G' in ESG – Governance – a question of balance

August 2020



Understanding the blue economy – time of a sustainable revolution

November 2020



Asian growth needs ESG

February 2021

CIO Special presentation



Exploring the E, S and G in ESG

December 2020

CIO Podcast



Biodiversity loss: How many extinctions add up to economic collapse?

December 2020



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Alvarado-Quesada, I., L. Hein, and H.P. Weikard (2014). Market-based mechanisms for biodiversity conservation: a review of existing schemes and an outline for a global mechanism. *Biodiversity and Conservation* 23, 1-21.

Erhard, M., A. Teller, and J. Maes (2016). Mapping and Assessment of Ecosystems and their Services. Mapping and assessing the condition of Europe's ecosystems: Progress and challenges. *Publications office of the European Union*.

Niehörster, F. and R.J. Murnane (2018). Ocean Risk and the Insurance Industry. Retrieved from:
<https://www.oceanrisksummit.com/Content/press-releases/FALK-MAIN-REPORT-FINAL-LOW-RES.pdf>. April 8, 2021.

Schuhbauer, A., R. Chuenpagdee, W.W.L. Cheung, J. Greer, and U.R. Sumaila (2017). How subsidies affect the economic viability of small-scale fisheries. *Marine Policy* 82, 114-121.

Sumaila, U.R., N. Ebrahim, A. Schubauer, D. Skerritt, Y. Li, H.S. Kim, T.G. Mallory, V.W.L. Lam, and D. Pauly (2019). Updated estimates and analysis of global fisheries subsidies. *Marine Policy* 109, 103695.

Biodiversity means variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.

Blue bond is a debt instrument issued by governments, development banks or others to raise capital from impact investors to finance marine and ocean-based projects that have positive environmental, economic and climate benefits.

Blue economy is the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs, while preserving the health of the ocean ecosystem.

The **compound annual growth rate (CAGR)** provides the investment yield on an annually compounded basis.

EUR is the currency code for the euro, the currency of the Eurozone.

ESG stands for Environment, Social, Governance, and is the acronym most commonly used for sustainable investments.

Green bonds are fixed-income instruments that finance climate-related or environmental projects.

Gross domestic product (GDP) is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.

The **gross value added (GVA)** is an economic productivity metric and measures the value of goods and services produced in the economy.

The **Official development assistance (ODA)** measures foreign aid by the Development Assistance Committee.

OECD stands for the Organisation for Economic Co-operation and Development, which stimulates economic progress and world trade.

SDGs stands for Sustainable Development Goals. They are a collection of 17 global goals set by the United Nations General Assembly in 2015. They include 169 targets.

Sustainability bonds are instruments whose proceeds will be exclusively applied to financing or refinancing a combination of green and social projects or activities.

USD is the currency code for the U.S. Dollar.

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