

Ocean science in support of blue growth /a blue economy

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Ocean Science and the United Nations Decade of Ocean Science
for Sustainable Development

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Environmental preservation
gives value to the sea!



Contribute to a culture of safety at sea!
In leisure or work, follow the safety rules
for lives at sea.
Go to sea and return safely.

PwC Blue Economy Center
of Excellence



Compass
*PwC Forward-Looking
Blue Arena*

HELM- PwC Economy of the Sea
Barometer

MAREECOFIN- PwC Economy
and Finances of the Sea

Publications

Since 2005 analysing quantitatively the Blue Economy
About 70 reports issued

All reports available in open source - <https://www.pwc.pt/en/issues/economy-of-the-sea.html>

HELM – PwC Economy of the Sea Barometer



PwC Circumnavigation



Compass



MAREECOFIN



Excellens Mare



PwC Purpose: “To build trust in society and solve important problems”

Into the 'Blue': The value of an integrated approach

Economy of the Sea / Ocean Economy
Blue Growth / Blue Economy...

=

Integrated Approach

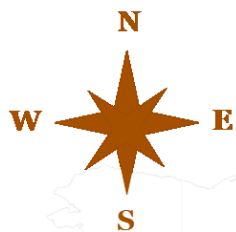
1. **'Blue' thinking'**: it's a more **sustainable** and **inclusive** approach, it promotes growth and employment, and it fosters innovation.
2. **Strategy to execution** - There are, at least, three essential elements required to put an integrated approach into action: the right **framework**, the right **people**, and the right **technology and equipment**.

"Blue - A Tridimensional Context":

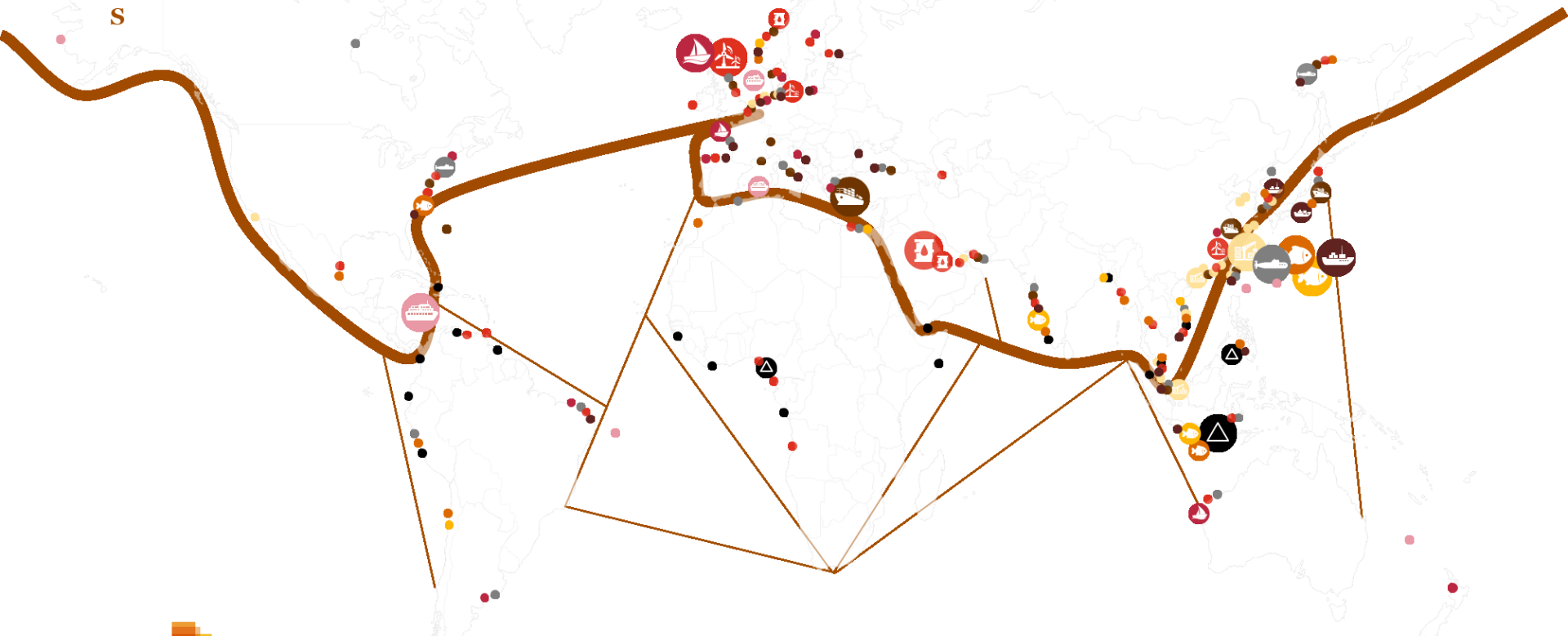
water surface, water column, seabed, wind above the water, sky above the water, aerospace above the sky

Finding mutual benefits





Economy of the Sea Map



The economy of the sea is an integrated approach to sea activities with the aim to promote growth and development in a sustainable way.

The map is made by overlapping different rankings of countries by industry on a map of the world.
Circumnavigation: HELM – PwC Economy of the Sea Barometer (World)
Edition n°4 – January 2019

<http://www.pwc.pt/pt/temas-actuais/economia-mar.html>

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Rank 1	Rank 2 & 3	Other	Description	HELM page
			Ownership of the world fleet (top countries)	36
			Top container terminals (top countries)	45
			Shipbuilding complexes (top countries)	60
			Offshore oil & gas production (top countries)	69
			Offshore wind capacity (top countries)	70
			Aircraft Carriers + Frigates + Destroyers + Corvettes + Submarines (top countries)	76

Rank 1	Rank 2 & 3	Other	Description	HELM page
			Pirate attacks locations	77
			Marine capture fisheries (top countries)	85
			Aquaculture (top countries)	90
			Cruises (top markets)	101
			Olympic medals in sailing (top countries)	115
				Commercial shipping trading track with the highest traffic

Unbalanced use of the Ocean

Some blue economy variables as an example

World Region	%	Blue Economy Variable
Three countries in Asia represent	84%	of world shipbuilding - vessel production completion in CGT (year: 2017)
Two countries in Europe represent	65%	of world offshore renewable wind capacity in MW (year: 2017)
Four countries in Asia represent	86%	of world vessel demolition in GT (year: 2016)
Caribbean and Mediterranean sea represent	51%	of world cruise passengers tourism destination (year: 2017)
Three countries in Asia represent	75%	of world aquaculture in tonnes produced (year: 2016)

Source: PwC HELM Circumnavigation 2018 Global Economy of the Sea Barometer

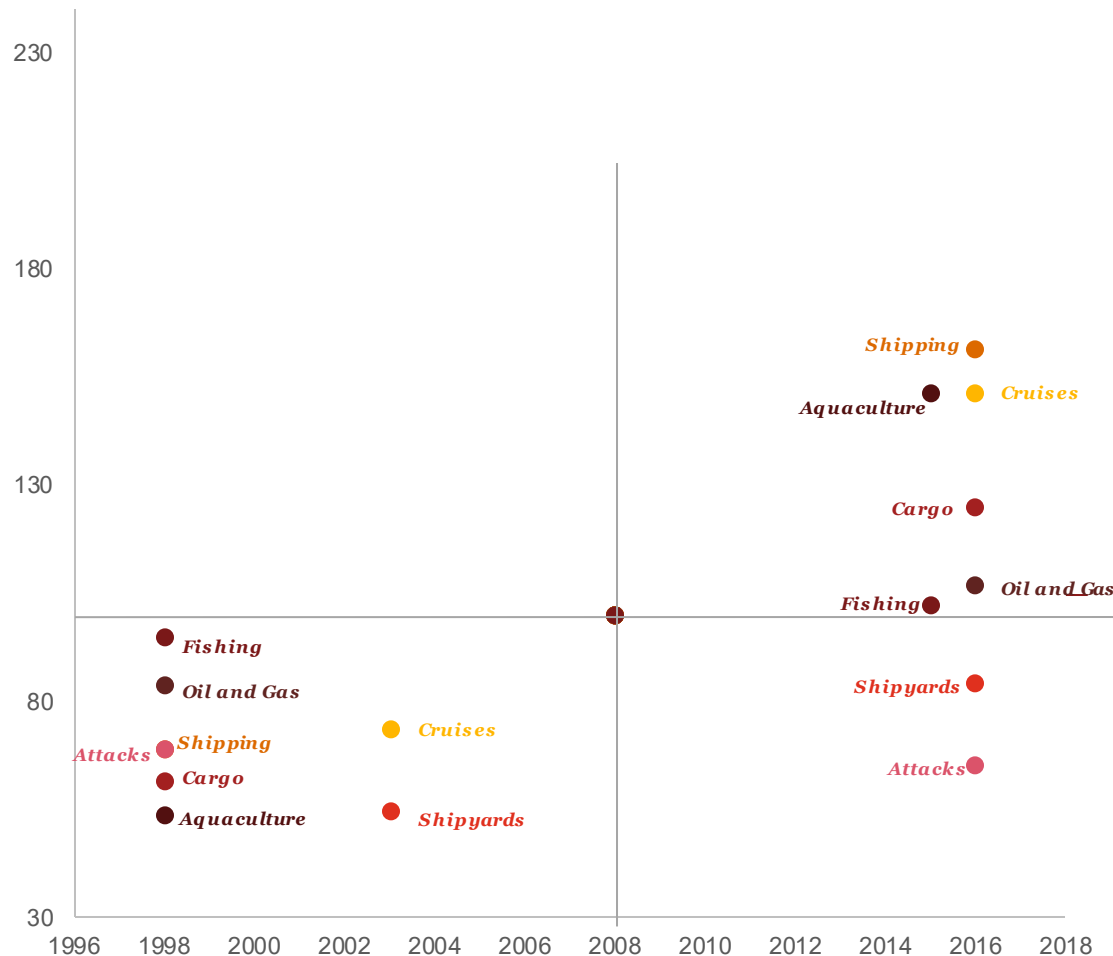
Human use of the ocean has increased significantly

Blue Time is Long - Patient Capital is Needed

The evolution of indicators in the last 20 years in the World

HELM – PwC Economy of the Sea Barometer

Index Base 100 = 2008



Environmental preservation gives value to the sea!



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Source: HELM – PwC Economy of the Sea Barometer

Blue Economy an Answer to Global Megatrends with impact on all UN Global Goals For Sustainable Development



Rapid Urbanization

The majority of the big cities are located in the coast or near water...



Technological breakthroughs

Digitization is challenging traditional competitiveness models. Technological breakthroughs are allowing us to overcome geophysical barriers. Robotics and satellite monitoring are critical for sea exploration...



Climate change and resource scarcity

An environmentally sustainable approach to the oceans is key for the development of mankind ...



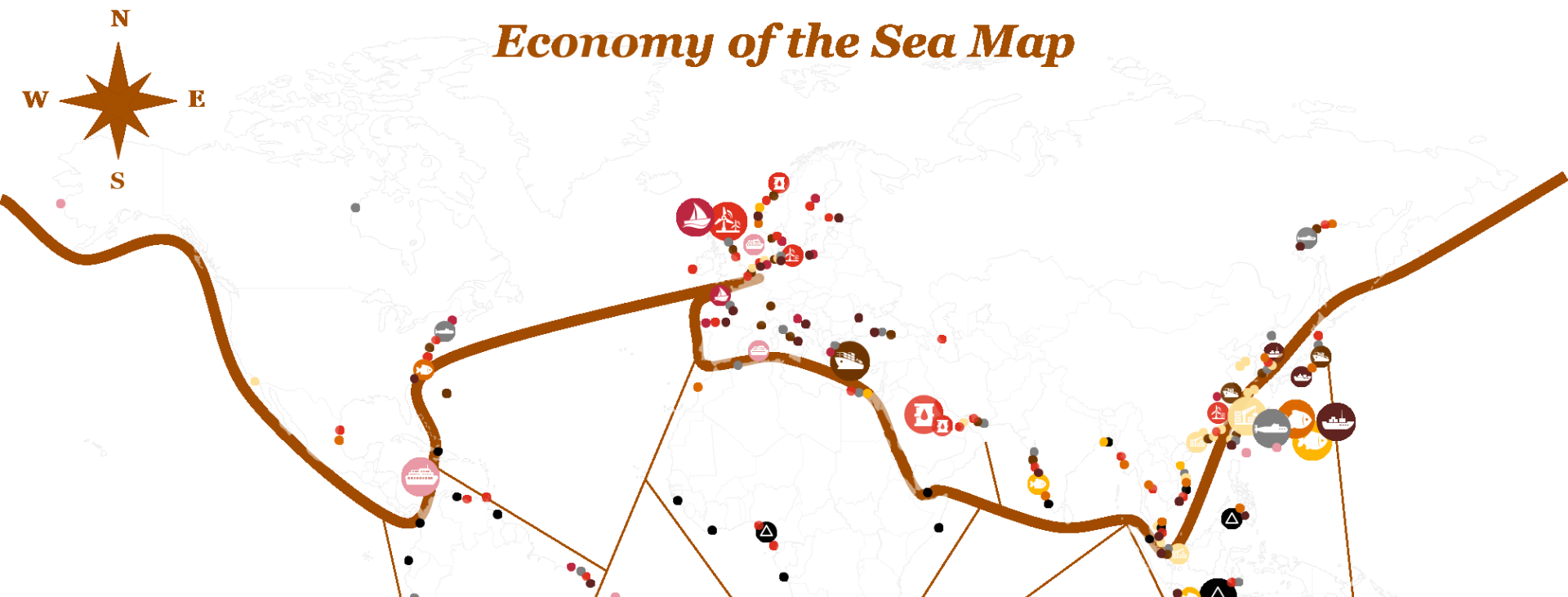
Demographic and social change

Oceans provide jobs, leisure, identity...



Shift in global economic power

Because the seas are shared, the strategy must likewise be shared – the economy of the sea needs to be integrated not just across industries, but across countries and regions...



Ocean is much different than it seems

- Each location in the ocean, on the coast line, in inland waters, is different and changes regularly in geophysical terms – Natural Blue Infrastructure - “Call to action for Nature Scientists” - Need to understand nature water ecosystems in a dynamic way - Considerable room for improvement
- Everyone has a different perception about what is most relevant in the ocean, on the cost line, in inland waters – Socio-Economic Blue Infrastructure - Need to understand how human beings relate to the water resources - “Call to action for Socio-Economic Scientists” – Huge room for improvement

Humans are brilliant land based beings that must recognize that development in the context of the oceans is different to development on land. The changes in the natural water environment tend to be faster and the ability for human beings to adapt to the changes tend to be slower than on land. Only an worldwide integrated approach to ocean sustainable development, that understands the ocean as different, can assure that human beings do not repeat the mistakes they made with development on land.

Thank you!

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