



# Linkages between Economic Growth, Environmental Sustainability and Resource Efficiency

Black Sea and Caspian Sea 2023 Conference

July 5, 2023

# As a leading strategy firm, we successfully operate in all major international markets, incl. Black and Caspian Seas Region

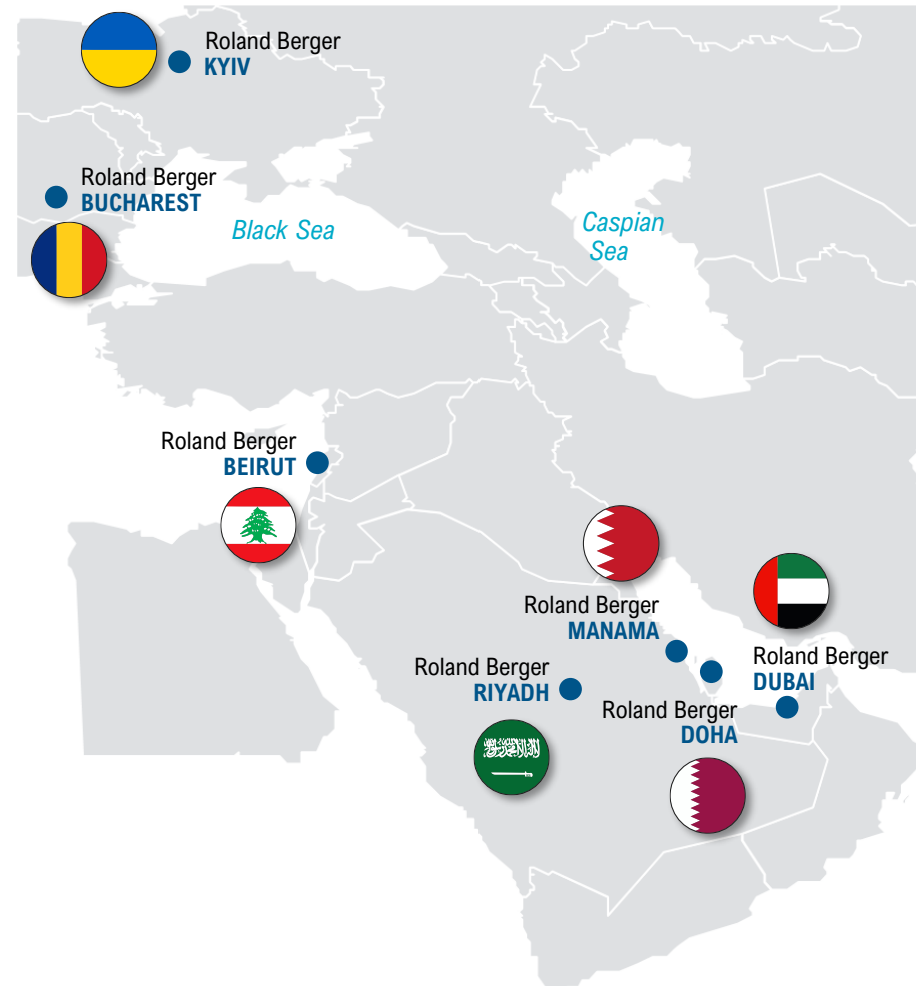
Roland Berger at a glance

Founded in **1967** in Germany by Prof. Roland Berger

**50+** offices in **35** countries, with approx. **3,000** employees


Over **300** partners with specific expertise organized in **8** global platforms

Serving over **1,000** international clients

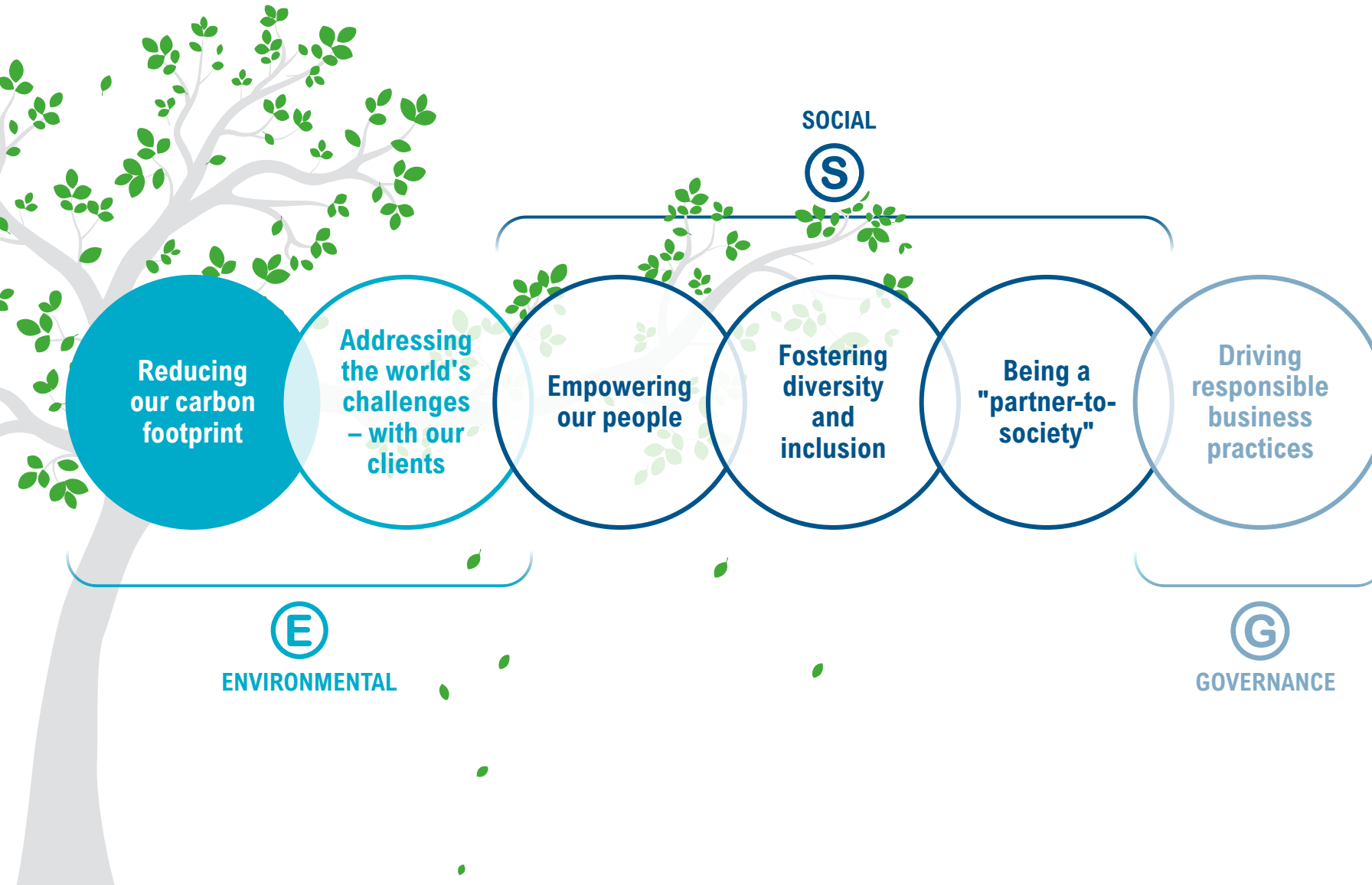


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# We have set ourself the most ambitious climate action targets in the consulting industry



## Our climate action ambition

Carbon neutral as of 2019

Net zero in 2028 – incl. reduction of emissions in line with Paris Agreement

Carbon negative – compensation of historical emissions

+ Roland Berger forest/solar

### 2028+

Carbon negative

# As countries struggle to reach net-zero pathway, regulatory pressure is likely to be reinforced – Current business models are at risk

“

The EU plans to reduce GHG<sup>3)</sup> emissions by at least 55% by 2030. This level of ambition for the next decade will put the EU on a balanced pathway to reaching climate neutrality by 2050.

– Ursula von der Leyen

We aim to have CO<sub>2</sub> emissions peak before 2030 and achieve carbon neutrality before 2060.

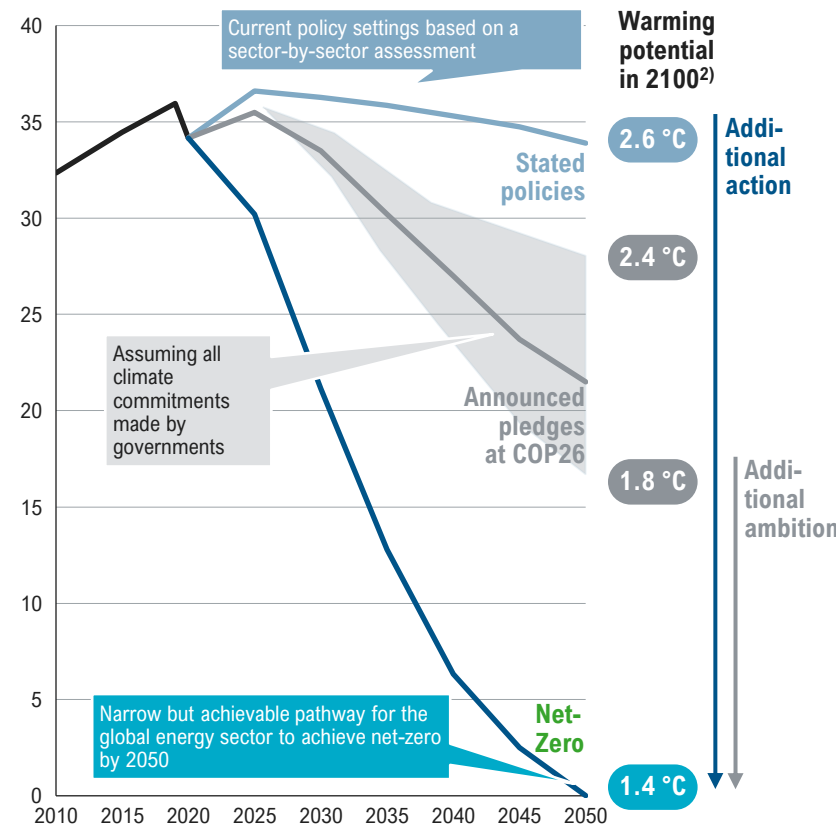
– Xi Jinping

We target a reduction of 50-52% from 2005 levels in economy-wide net GHG<sup>3)</sup> pollution in 2030 and having the country achieve net zero emissions no later than 2050.

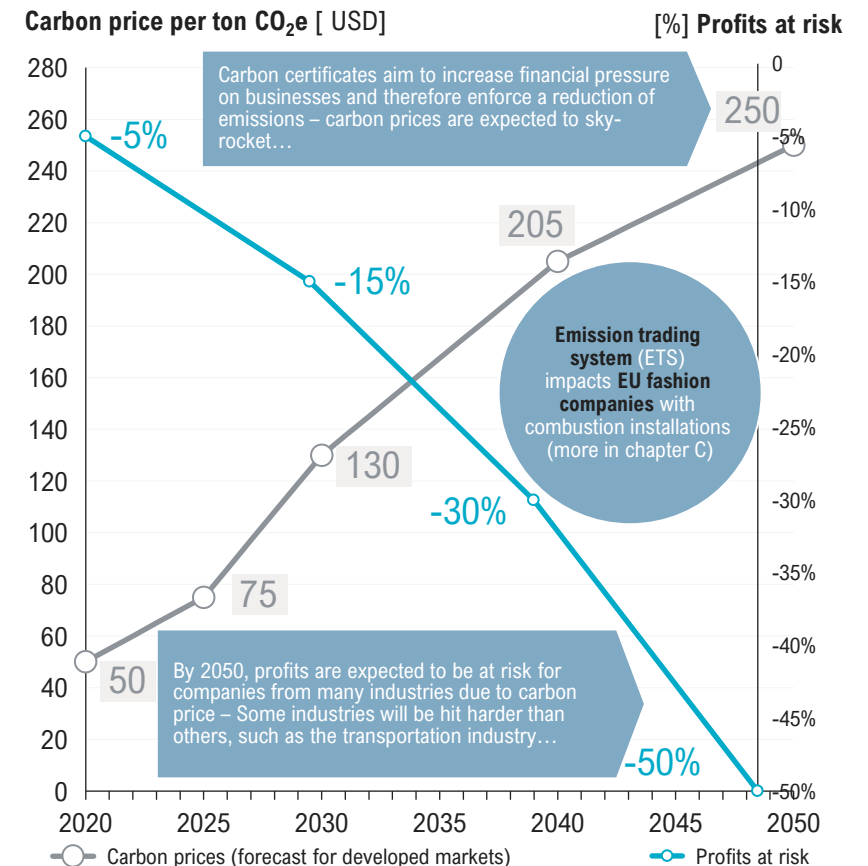
– Joe Biden

”

Global GHG emissions trajectories and corresponding global warming [Gt CO<sub>2</sub>e]



Politicians are planning to enforce emission reductions, bringing businesses and their profits into troubles

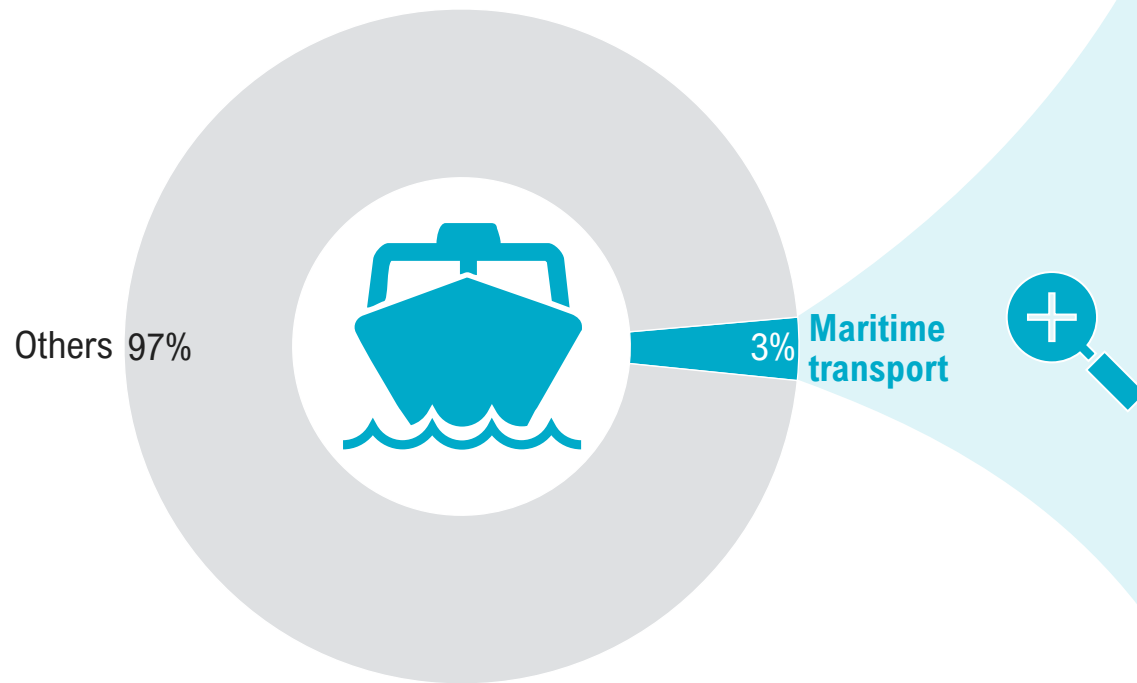


1) Total CO<sub>2</sub> includes carbon dioxide emissions from the combustion of fossil fuels and non-renewable wastes, from industrial and fuel transformation processes (process emissions) as well as CO<sub>2</sub> removals;  
 2) Temperature increases displayed reflect the 50% confidence level, IEA = International Energy Agency, Announced pledges scenario is updated to reflect pledges made until 3rd November 2021; 3) Greenhouse gas

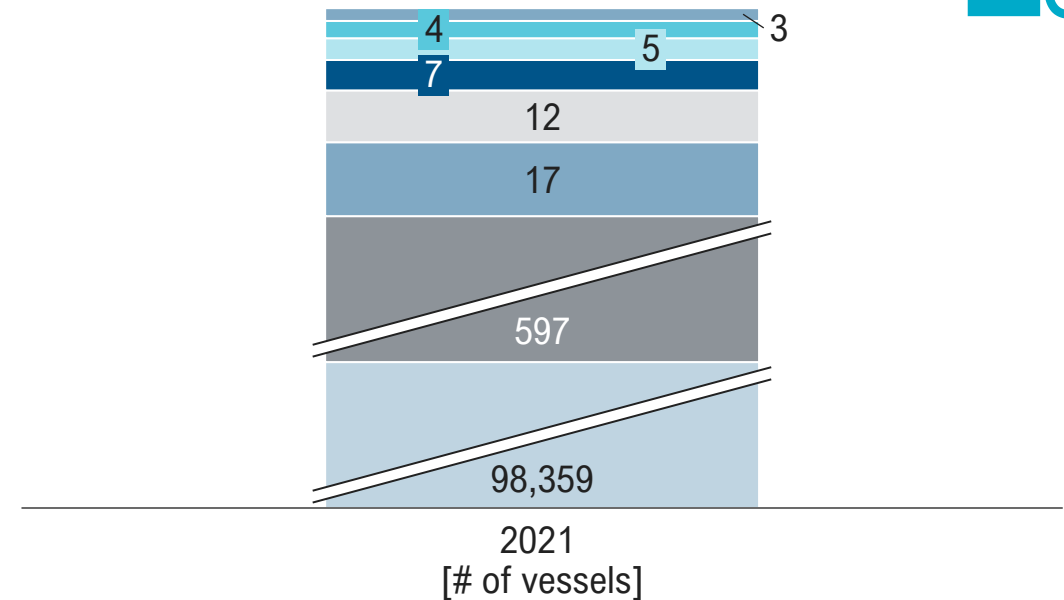
# The global maritime industry today accounts for ~3% of GHG emissions, with 99% of vessels leveraging conventional fuel types

GHG emissions from shipping, 2020

## Global greenhouse gas emissions by sector



### Type of fuel [# of vessels]



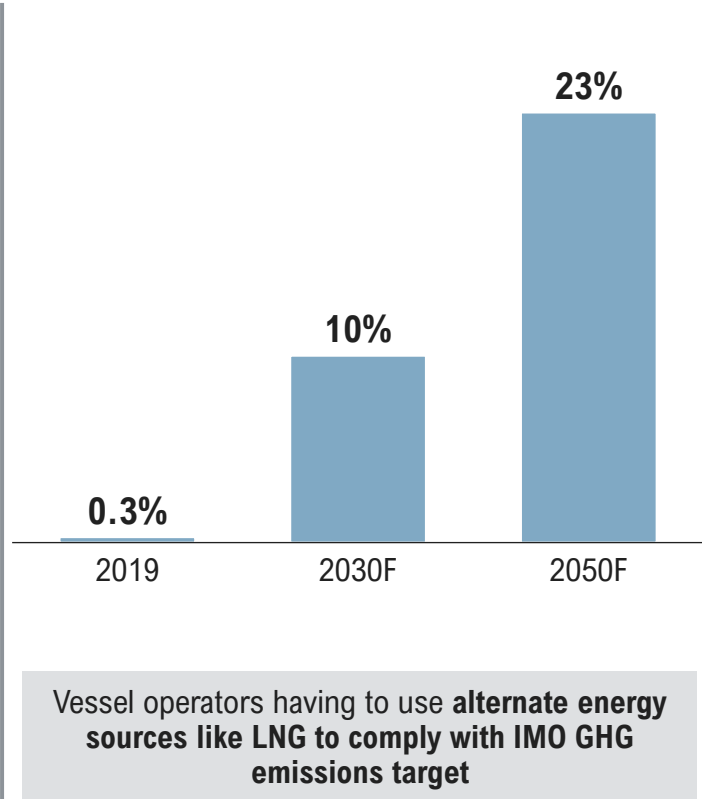
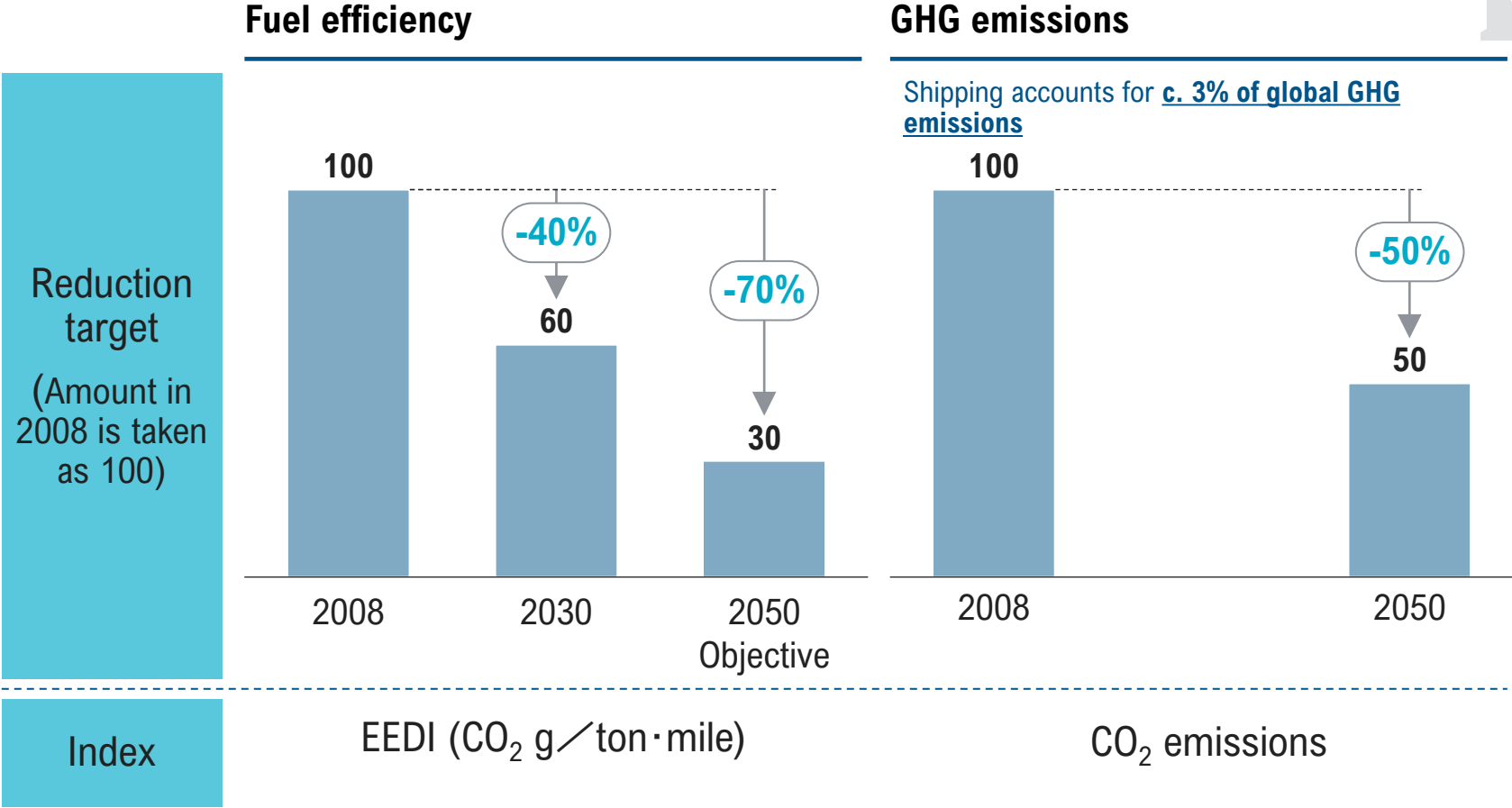
■ Conventional 
 ■ LNG 
 ■ Biofuel 
 ■ Methanol 
 ■ Nuclear 
 ■ Ethane 
 ■ LPG 
 ■ Other

# IMO has set an ambitious target for the sector of -50% of GHG emissions by 2050 notably thanks to increased fuel efficiency and a roll-out of LNG vessels

Overview of IMO CO<sub>2</sub> emissions reduction strategy



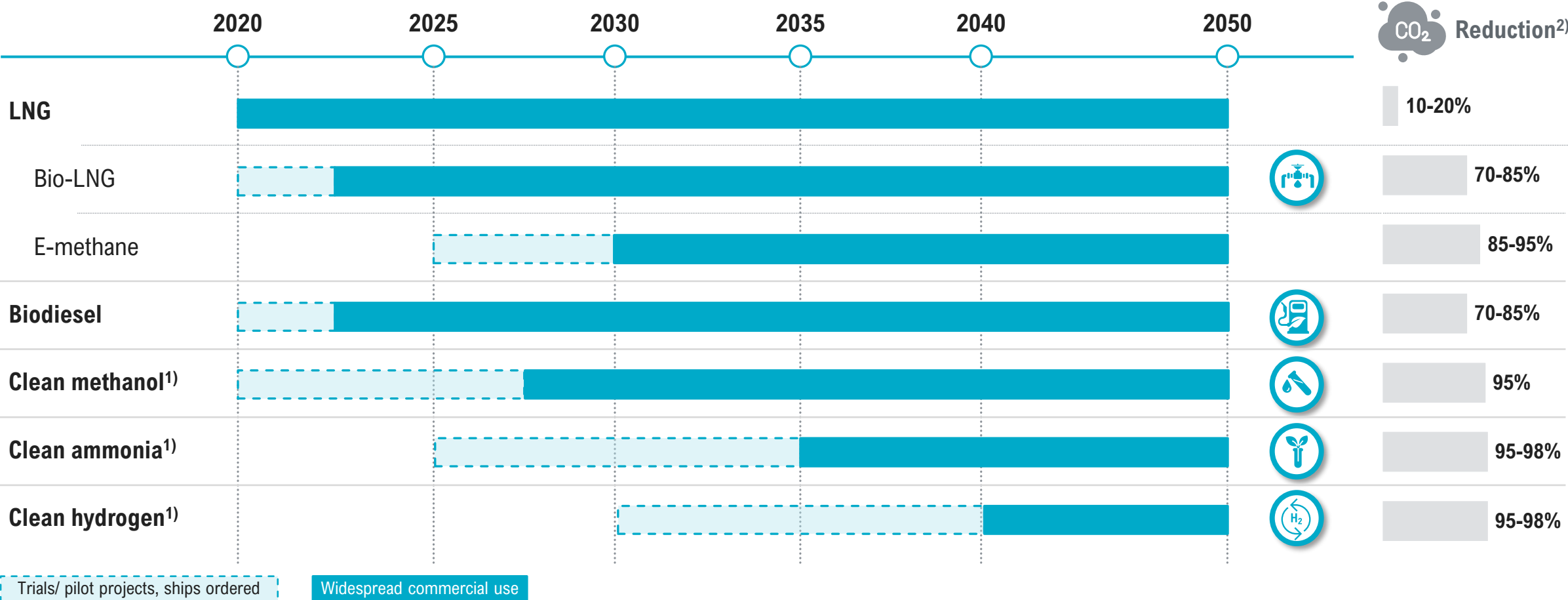
**LNG proportion in Global Marine fuel mix**



1) Energy Efficiency Design Index

# One priority ought to be decarbonizing emissions from marine services, which will be reliant on shifting to an alternative fuel strategy over time

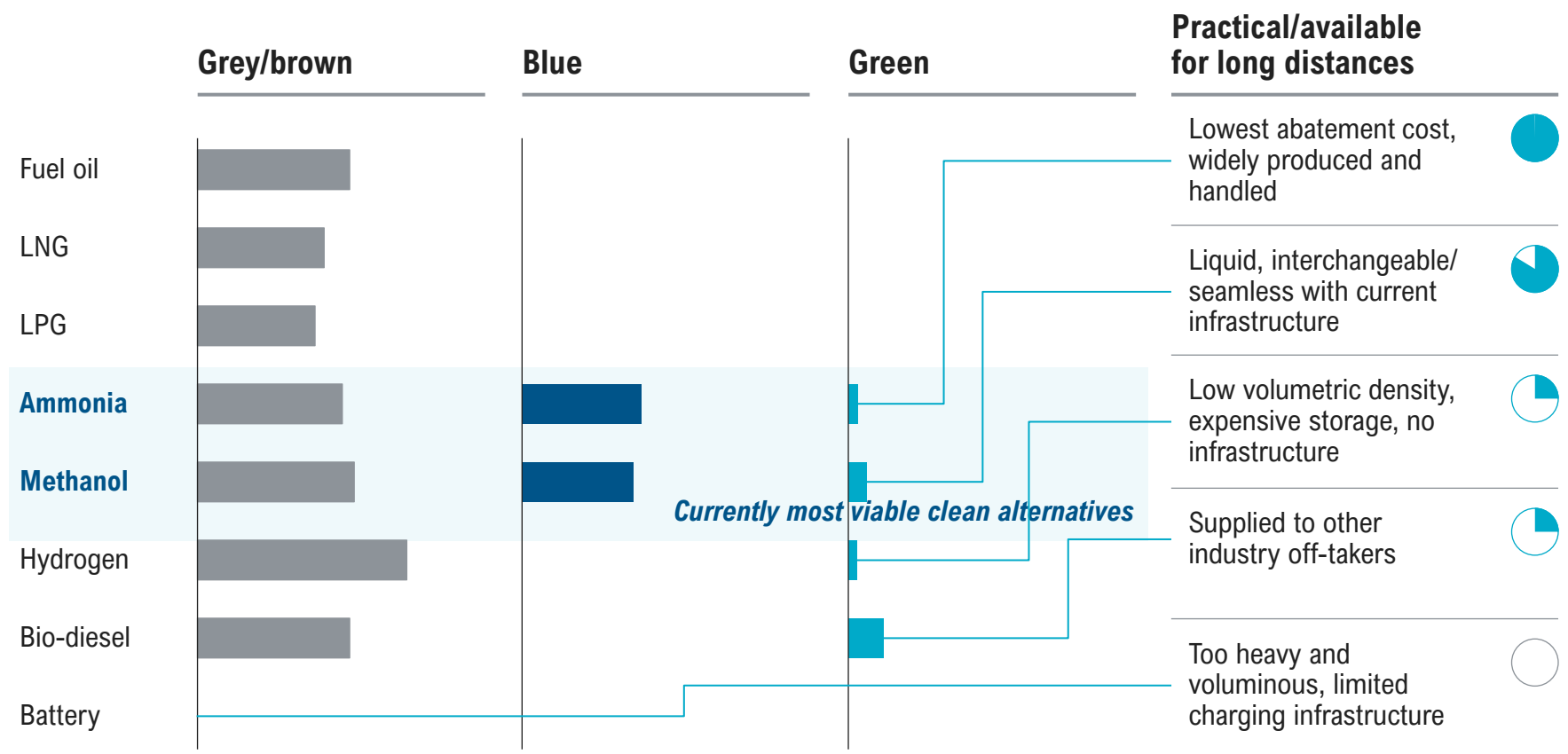
Alternative fuels development and deployment timeline – Indicative



1) Production from renewable energy sources; 2) Vs Heavy Fuel Oil

# H<sub>2</sub> and derivatives such as ammonia and methanol are viable fuels to achieve decarbonization targets for maritime transportation

Importance of ammonia and methanol to decarbonize maritime – emissions [CO<sub>2</sub>/MJ]



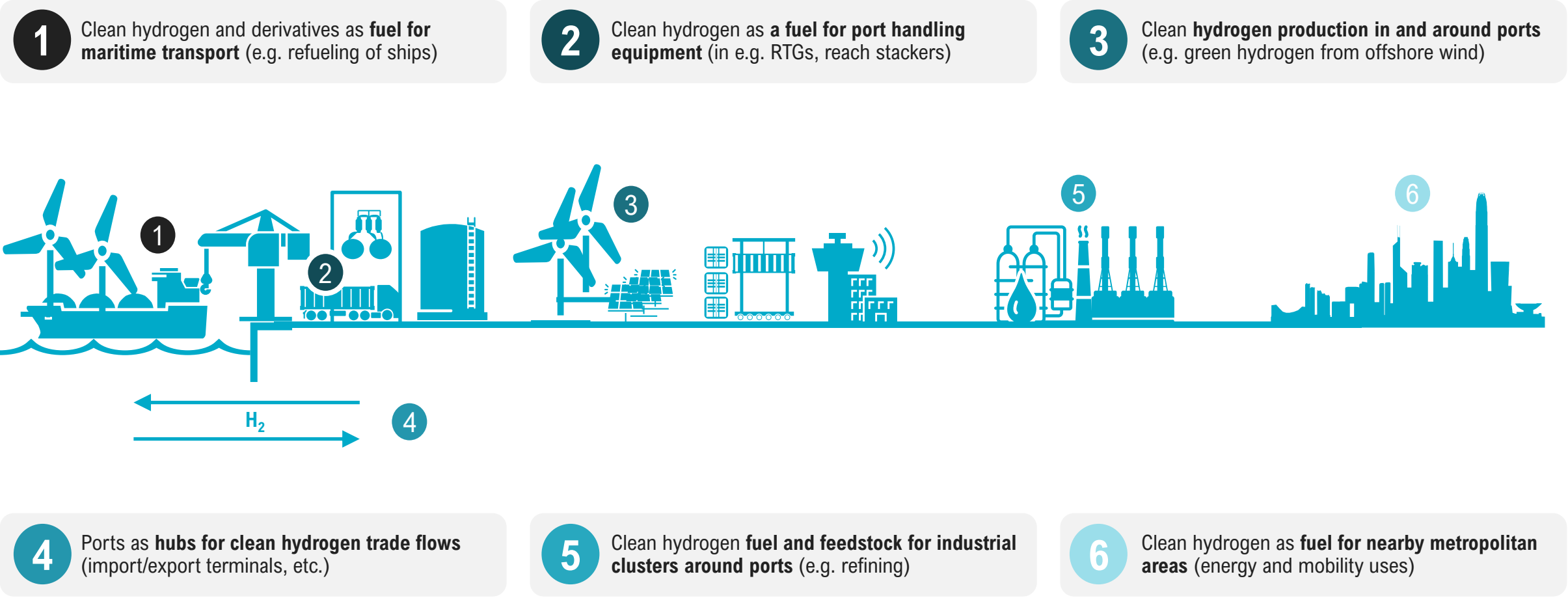
- Hydrogen derivatives**, ammonia and methanol, will likely **drive decarbonization** of maritime transport
- Green ammonia burns the cleanest** and has lowest emissions, whilst e-methanol comes at lower additional CAPEX
- However, **blue pathway** expected to be **widely utilized as a bridging solution** until industry fully scales up to green production

Note: Grey fuel is produced using fossil sources as feedstock; Blue is when production is based on fossil sources, but CO<sub>2</sub> emissions largely captured by CC(U)S technology; Green is when renewable energy is used to electrolyze water to obtain H<sub>2</sub>



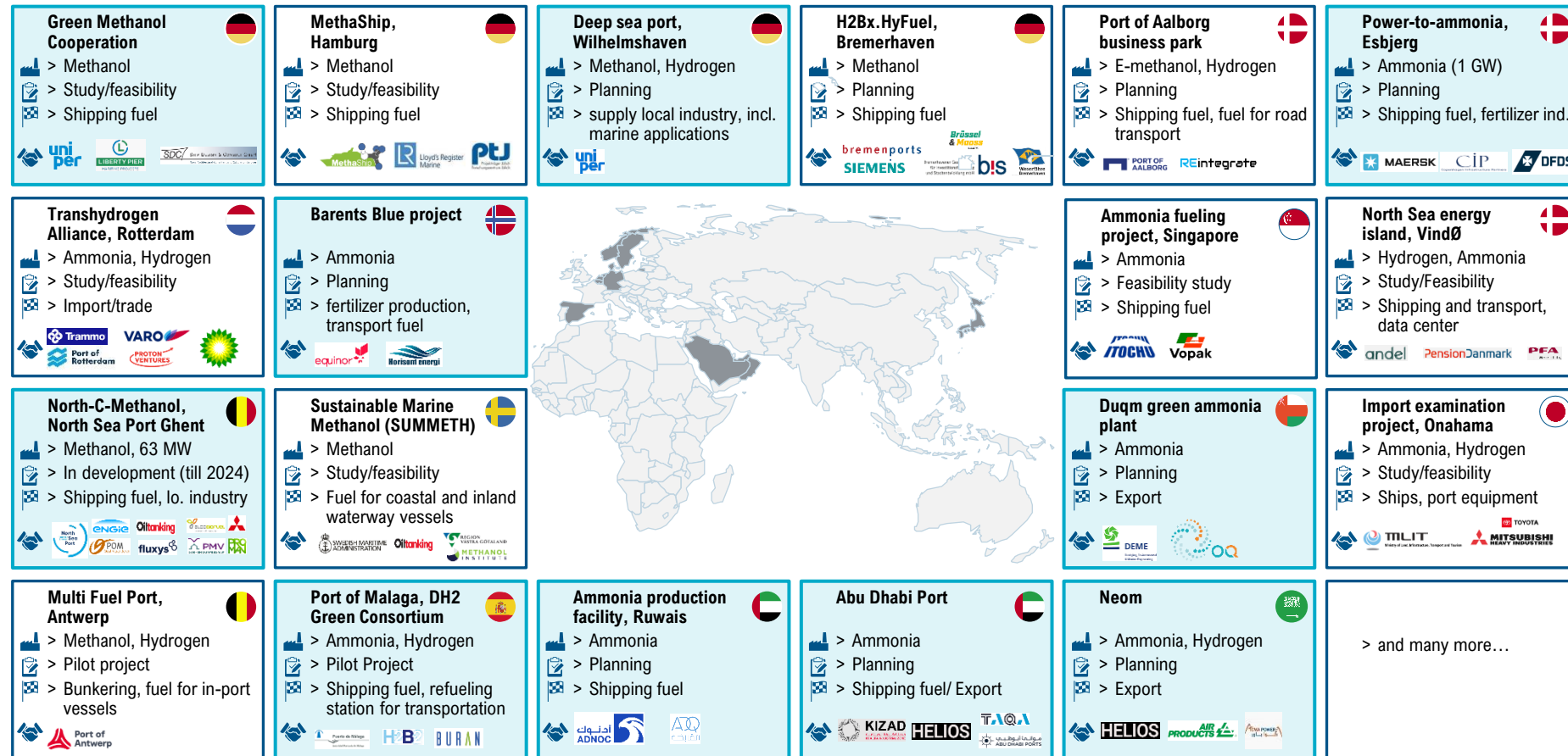
# Ports can tap into six different applications across the new hydrogen economy

Six key domains of hydrogen-based decarbonization in and around ports



# Assessment of ports around the world highlights several projects related to hydrogen and its derivatives, methanol and ammonia

## Ports with hydrogen plans (selection)



- Projects related to hydrogen and its derivatives are widespread across ports
- Key distinction drawn between **production-oriented projects vs application-only projects**

Application-only project
  Production project
 🏭 Products
 📅 Current phase
 🚢 End application(s)
 🤝 Partner(s)

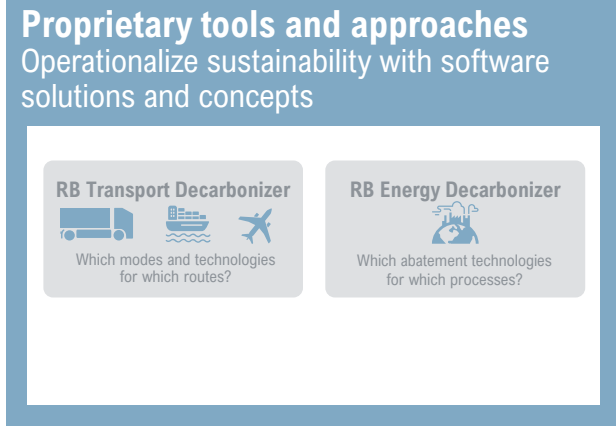
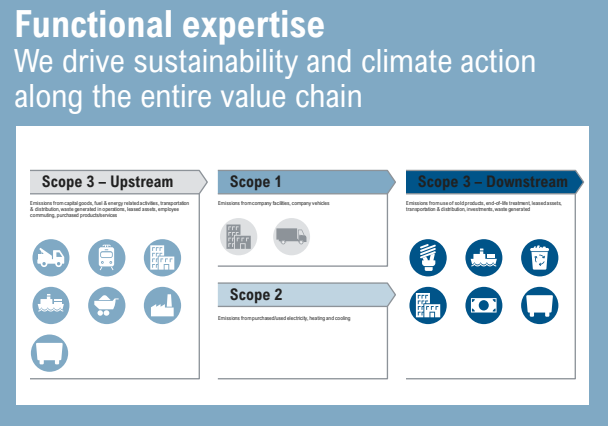
# Roland Berger brings the expertise and experience required to realize real impact for you – We make sustainability and climate action work in practice

The Roland Berger sustainability and climate action (SCA) expertise and experience

## We help to achieve real impact



With net zero in 2028, our RB targets are the most ambitious in the consulting industry



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