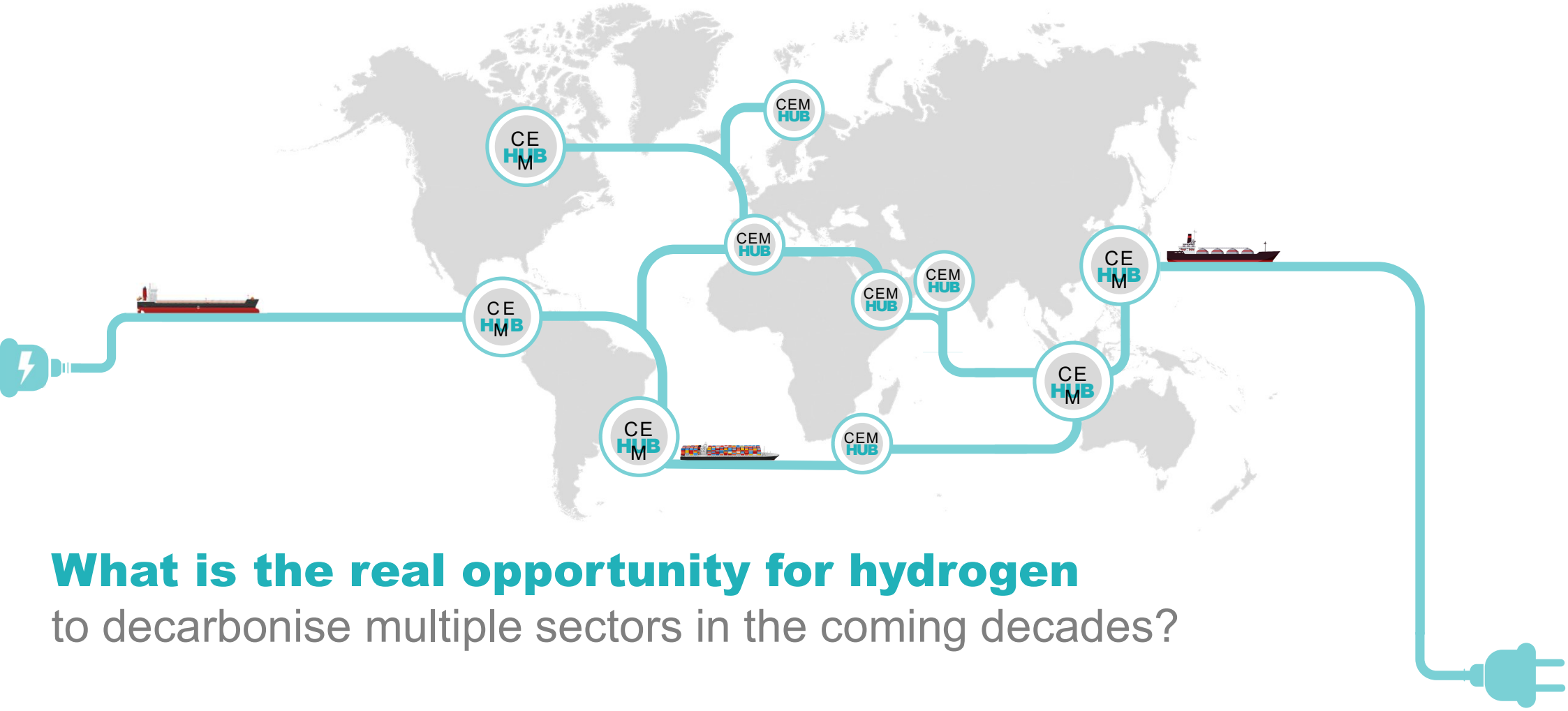
International Chamber of Shipping

ICS Hydrogen Demand Report

2024

Key Findings

Why are we here?

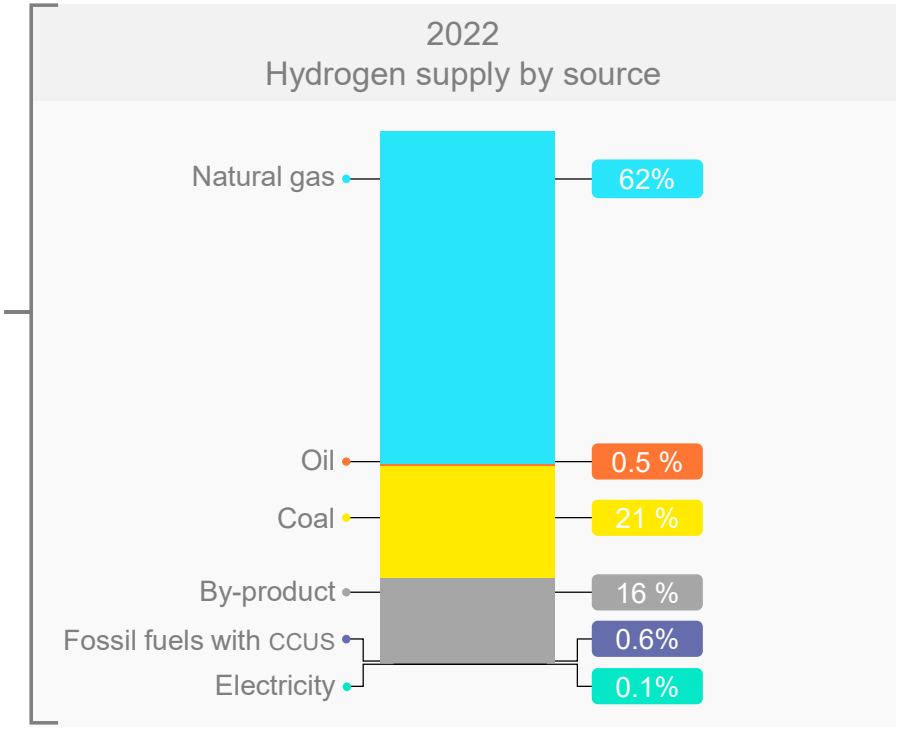


What is the real opportunity for hydrogen

to decarbonise multiple sectors in the coming decades?

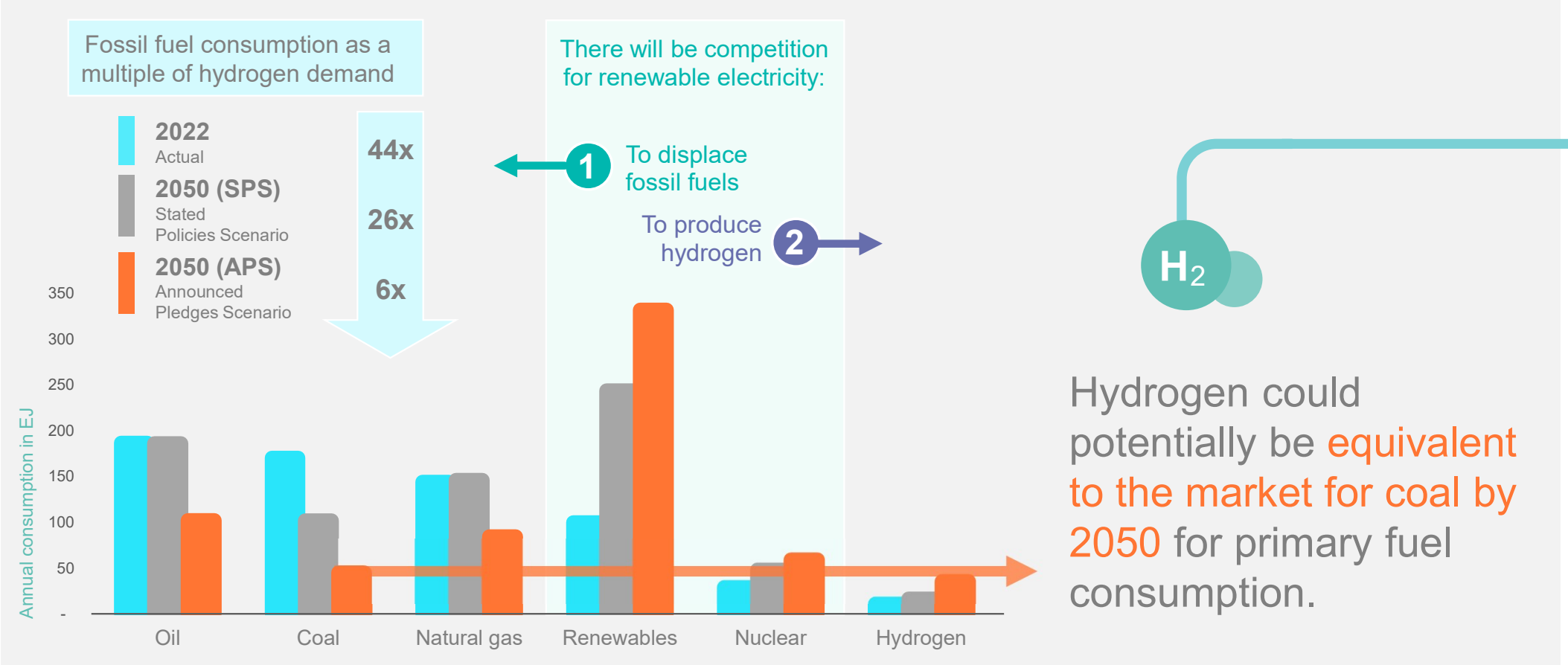
Hydrogen can play an important role in **global decarbonisation efforts**.

However, currently hydrogen is predominantly **fossil-fuel based**, with production processes emitting **900Mt of CO_2**.



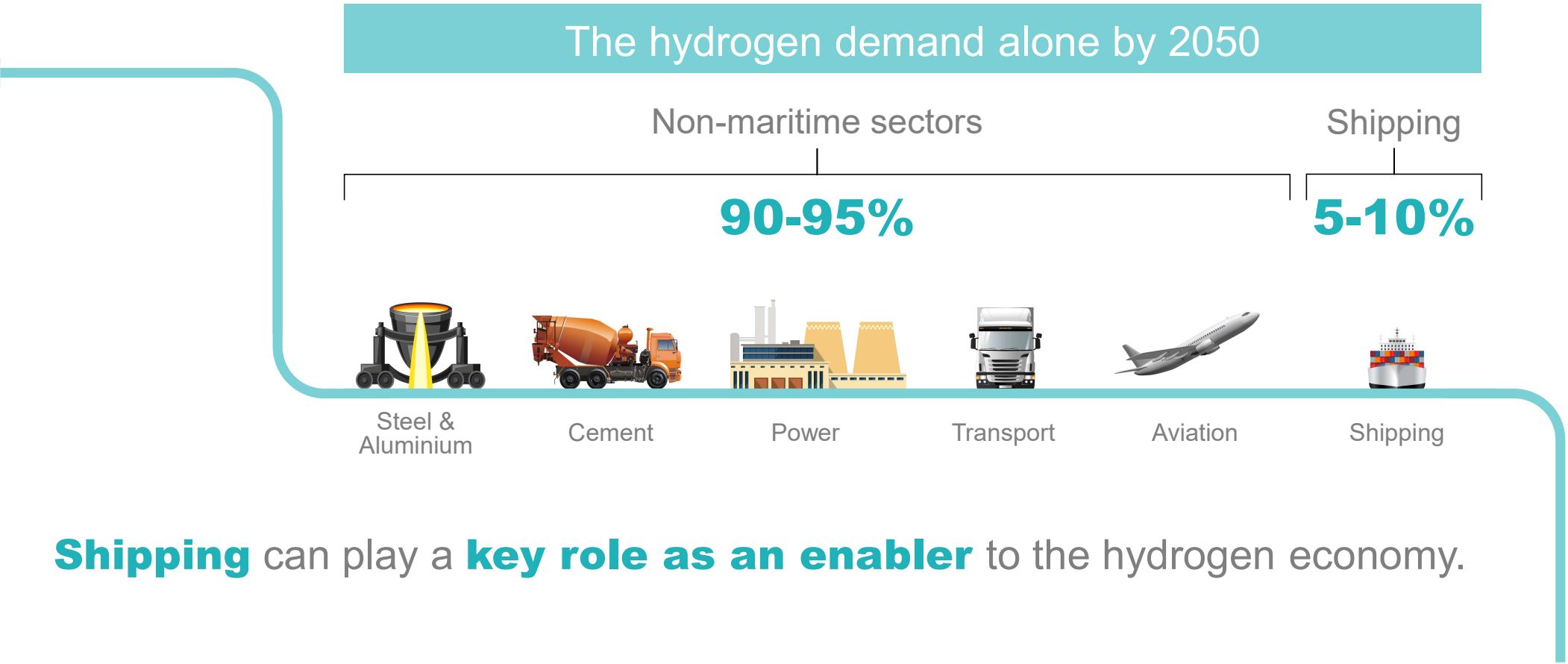
similar to the emissions of the global shipping sector

Hydrogen can not only **play an important role in** global decarbonisation efforts but also **to replace fossil fuel use**.



Source: IEA, World Energy Outlook 2023

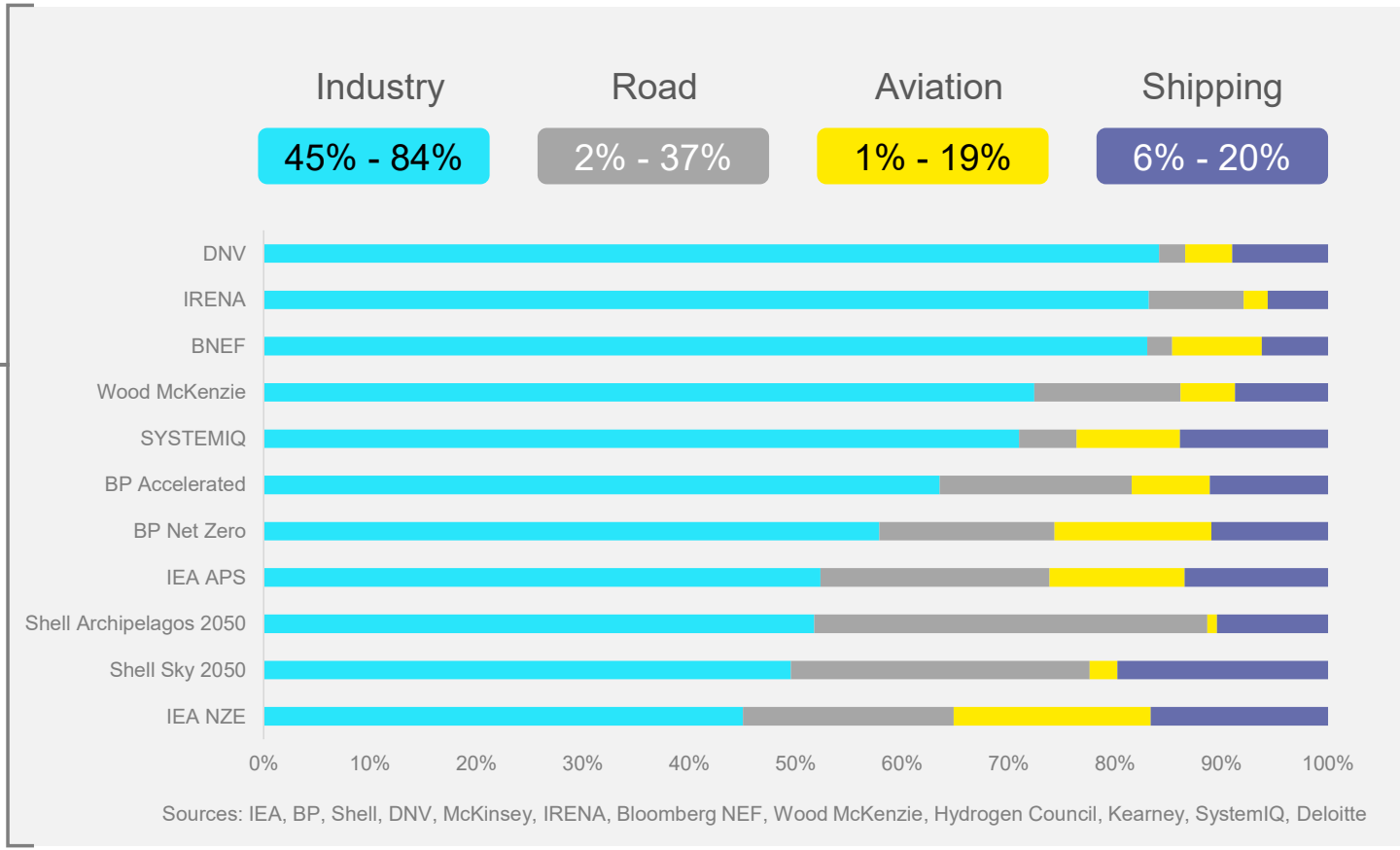
Hydrogen winners, **which sectors can benefit and route to success?**
New use cases may stimulate green hydrogen demand and **potentially compete for hydrogen and its derivatives**.



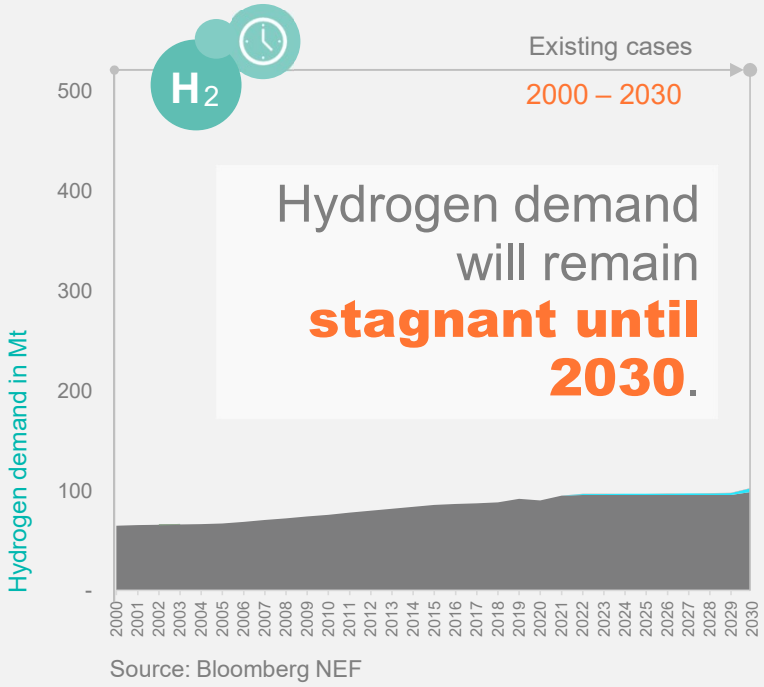
Shipping can play a **key role as an enabler** to the hydrogen economy.

Most 2050 hydrogen demand scenarios see growth in hydrogen but there is **tremendous variability, increasing uncertainty for businesses and investors** about the potential uses across sectors.

However, all scenarios see **Industry dominating** hydrogen demand and **not transport** sectors by 2050.



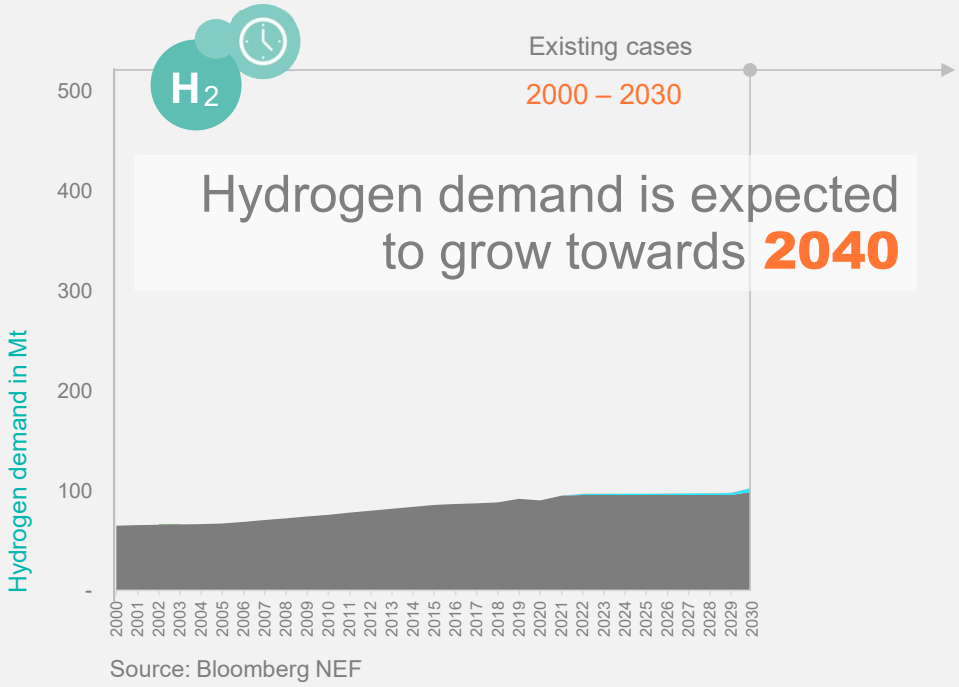
Hydrogen demand timeline: which sectors will use it first and when do other sectors come in?



Source: Bloomberg NEF

…but to go beyond existing use sectors, **infrastructure and power access** would **need to be addressed** so ‘new’ use sectors can start to uptake hydrogen (steel, aluminium, cement, etc).

Transport sectors such as Shipping, Aviation, and Road still to have a **limited share of global demand** (less than 5%).



Source: Bloomberg NEF

- Shipping
- Aviation
- Road
- New use cases

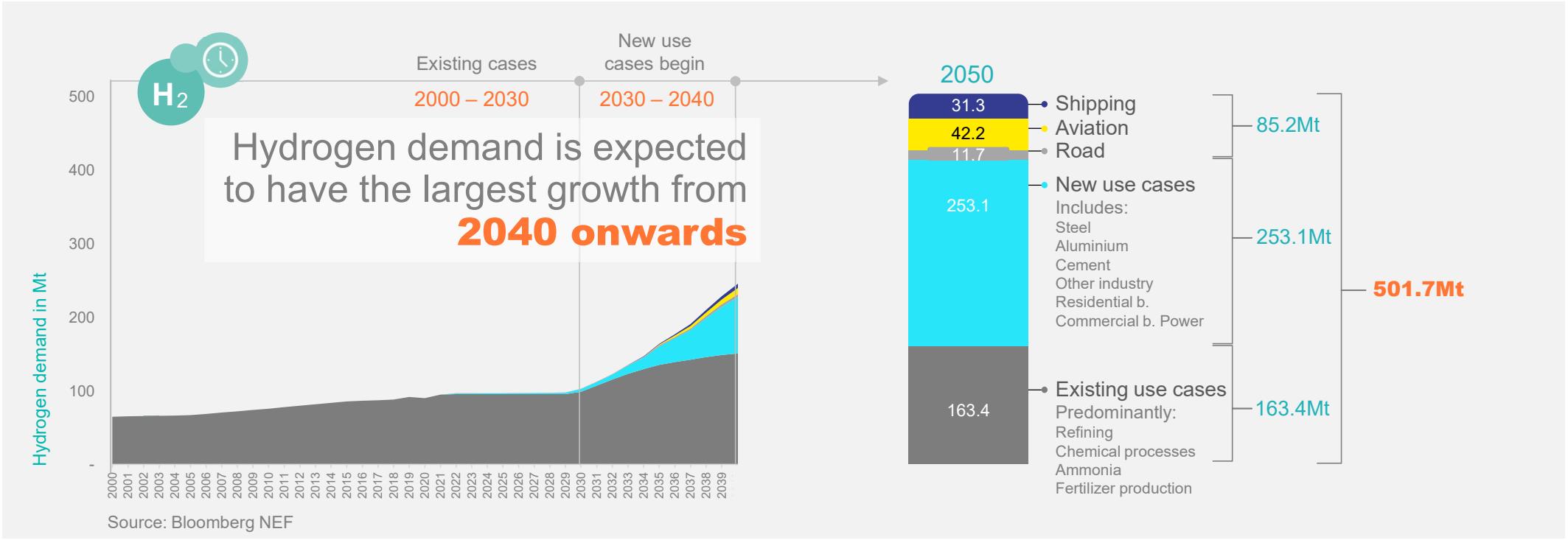
  Includes:
  Steel
  Aluminium
  Cement
  Other industry
  Residential b.
  Commercial b. Power

- Existing use cases

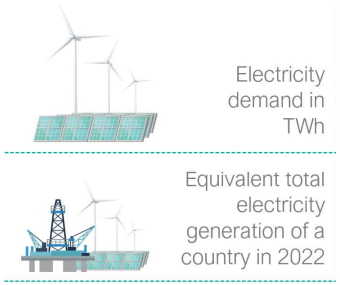
  Predominantly:
  Refining
  Chemical processes
  Ammonia
  Fertilizer production

It is expected that if infrastructure, regulation and power sector access bottlenecks are unlocked and New sectors prepare to use hydrogen and its derivatives, **Hydrogen could reach 500 Million tonnes**.

Transport sectors hydrogen demand would increase benefiting from lower cost and extended availability.



Expected annual growth of green hydrogen demand will lead to **unprecedented electricity demand**. This represents **a generational opportunity/challenge**.

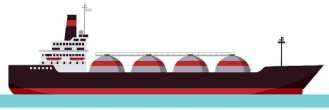


To only meet **5 Million tonnes** of hydrogen demand the world would need the equivalent of **Malaysia's** whole electricity generation in a year (lower case) or **South Africa** (higher case).

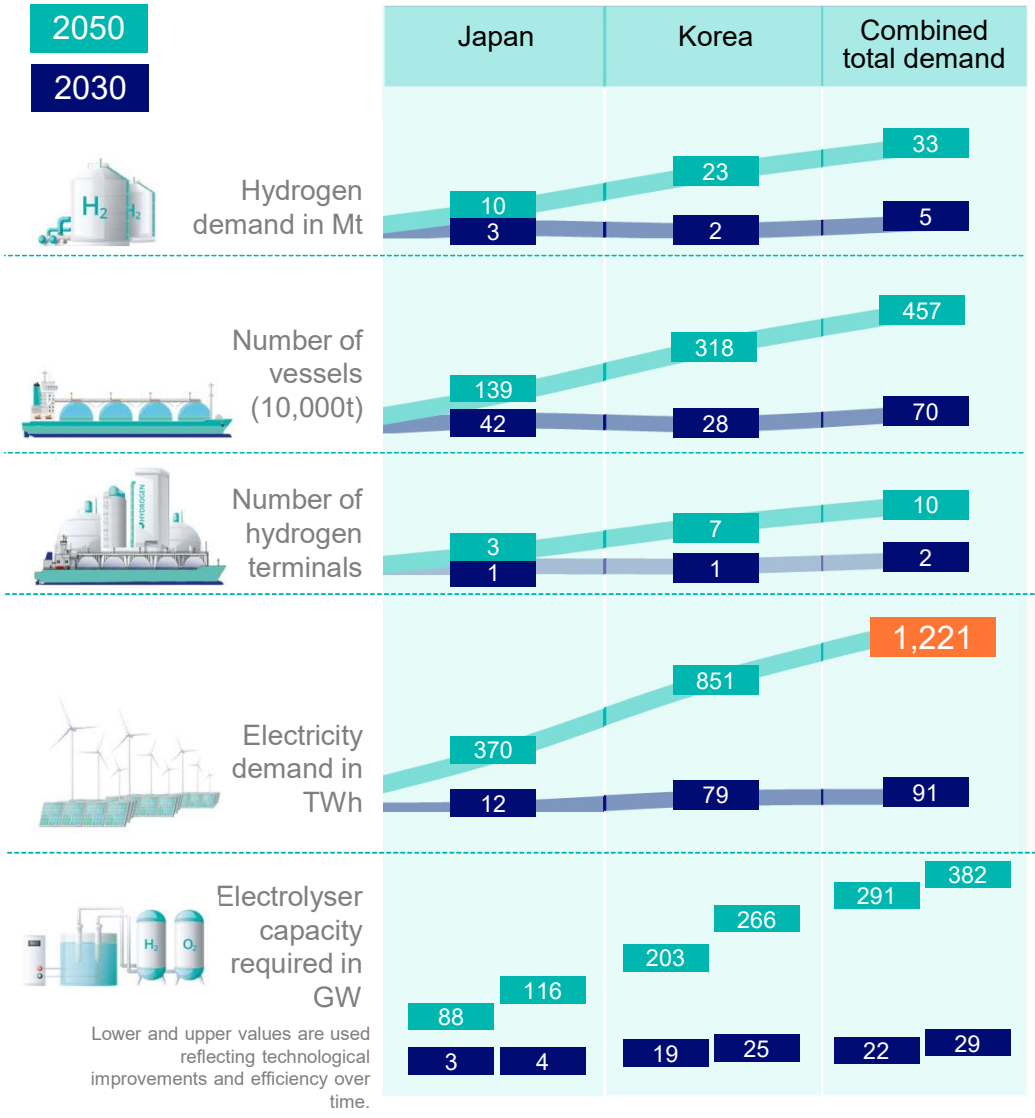
For **30 Million tonnes** of green hydrogen to be met, the equivalent of the whole of **South and Central America's** electricity would be required.

Expected annual growth of green hydrogen demand will lead to **unprecedented electricity demand**. This represents **a generational opportunity/challenge**.

The annual hydrogen demand would also mean increasing the fleet to transport hydrogen by ship. It would require up to **411** new hydrogen vessels (for long distances) or up to **500** vessels if transported as ammonia.



Example:



Lower and upper values are used reflecting technological improvements and efficiency over time.

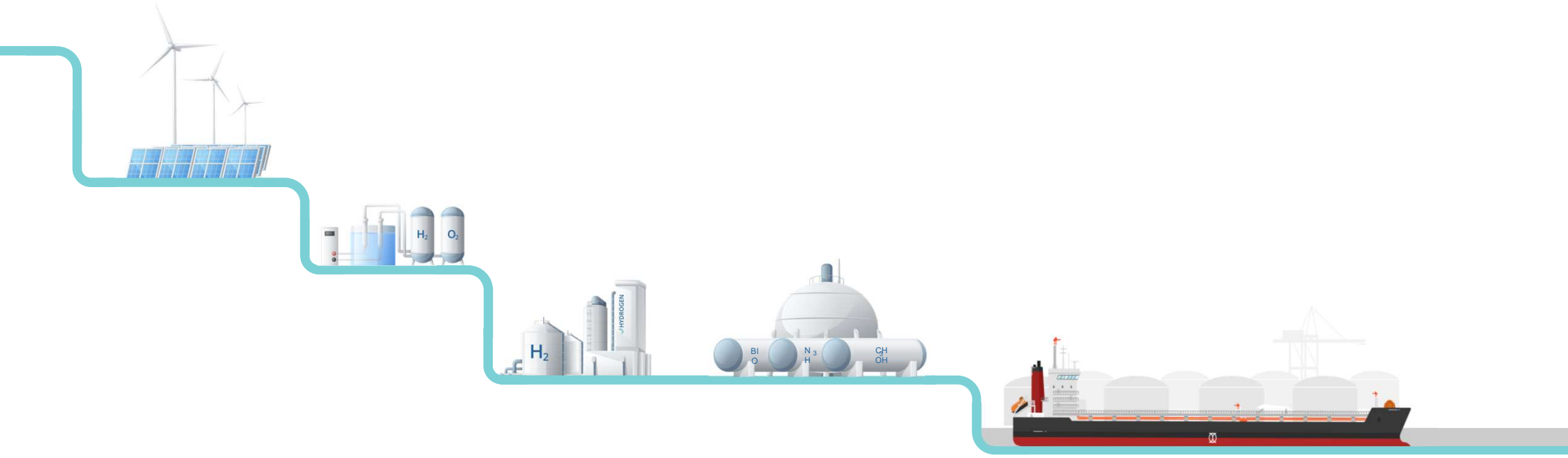
Combined
South Korea and Japan
hydrogen demand could reach
33 Million tonnes by 2050,
making these Asian economies the largest driving market.

By 2050 hydrogen demand leads to an electricity demand of more than **6x** the current renewable electricity production.

And roughly **3/4** of current total generation.

How can the maritime sector support the aggregated global hydrogen demand?

The maritime sector can boost demand for hydrogen production close to ports, helping infrastructure develop sooner both for exports/imports but also for bunkering.



Key points for success:

1. Governments have a key role to play to unlock this opportunity for early adopters, by prioritising demand incentives over supply support, to increase offtake agreements.

2. Hydrogen planning and its location will matter on both accessibility and cost for sectors. Proximity to clean hydrogen and its infrastructure becomes key.

3. The scale and speed of the transition to hydrogen for some industries is a key component to drive demand.

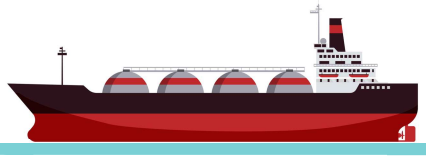
4. Sectors that have clear long-term regulations and facilitate infrastructure development have a better chance of pulling demand.

5. Governments should prioritise de-risking policies to kick-off hydrogen demand to new hights.

Shipping Transports

80%
of global trade

36%
of the worlds energy

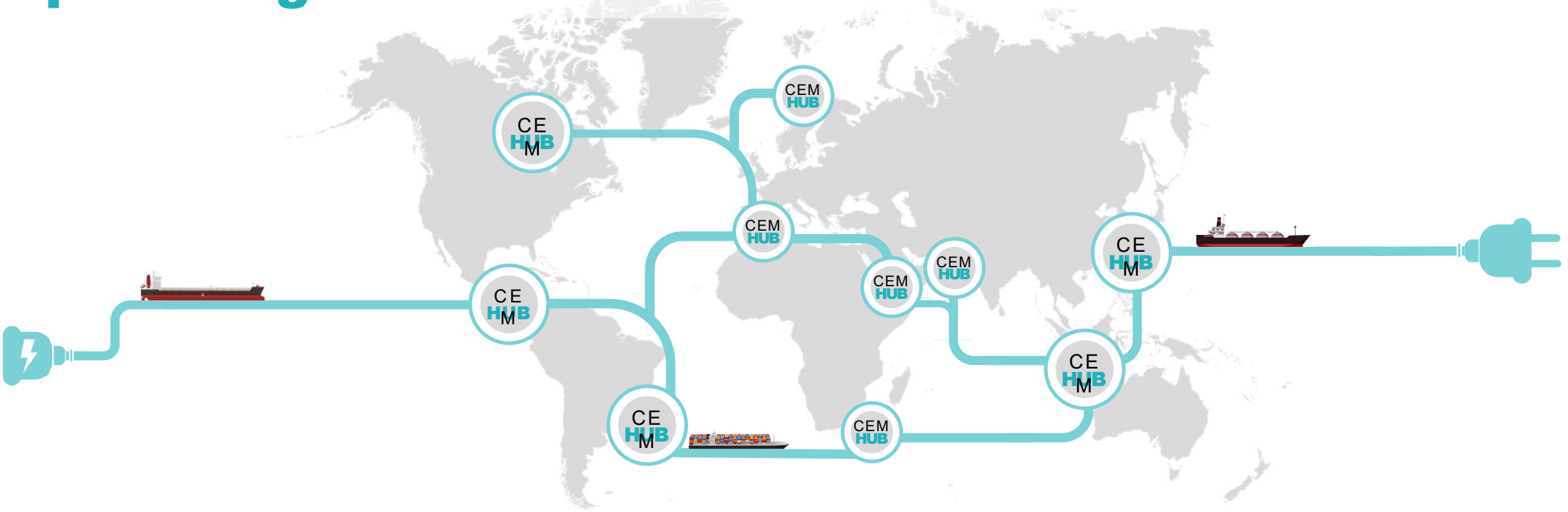


50%
of future-fuels trade to be shipped

- Shipping alone transports 80% of global trade.
- 36% of the world's current energy is transported by sea from source to consumption.
- The International Renewable Energy Agency (IRENA) estimates that over 50% of the trade of zero carbon fuel will need to be transported by ship from producing to importing countries by 2050.

CLEAN ENERGY MARINE HUBS
AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

Together Governments and industry are establishing Clean Energy Marine Hubs across the globe, **providing low-carbon fuels for all**



Governments and industry by launching the CEM-Hubs initiative under the Clean Energy Ministerial platform will seek to establish Clean Energy Marine Hubs across the globe, coordinating efforts to advance faster together in de-risking and greening the energy-maritime link and greening the global supply chains, by providing low-carbon fuels for ALL.

CLEAN ENERGY MARINE HUBS
AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

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Initial five supporting governments


Canada


Norway


Panama


UAE


Uruguay

CLEAN ENERGY MARINE HUBS

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www.cleanenergyministerial.org

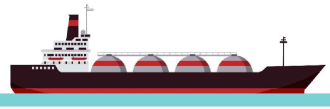
Hydrogen can play a **key role for the maritime transition.**

Regulatory certainty could favour maritime hydrogen demand to ‘pull hydrogen’ to the sector.

Readiness at ports and infrastructure development to remove barriers for maritime uptake **will be key** to show how both maritime and other sectors could increase mobility adding energy-security and enhance diversification.

Standards and Insurance Products will be required to support the rapid deployment and use of new fuels in all sectors.

Governments should prioritise de-risking policies to kick-off hydrogen demand.



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Thank you!

Report available to download at ICS website

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