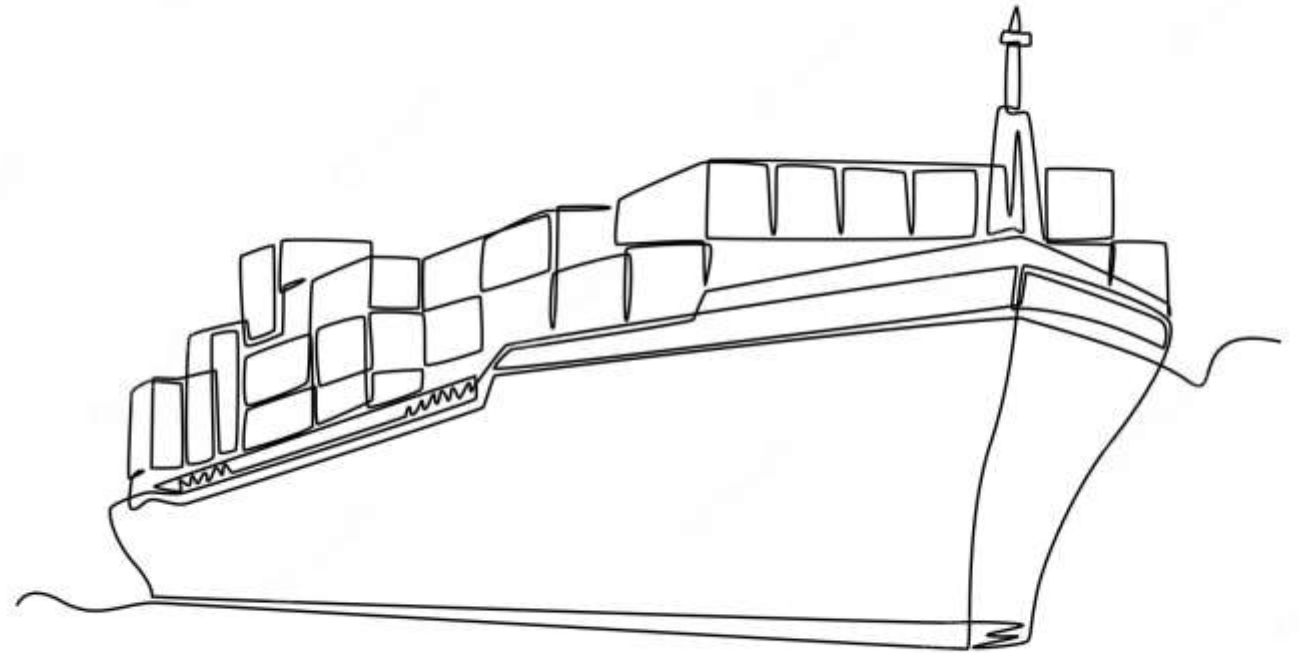


How will a NB look like in 2035 ?



Panagiotis Bousounis

DNV Cyprus Operations Manager

Ship design timeline..



2035?

Factors affecting ship design in 2035

Decarbonization

- Energy efficiency
- Alternative fuels

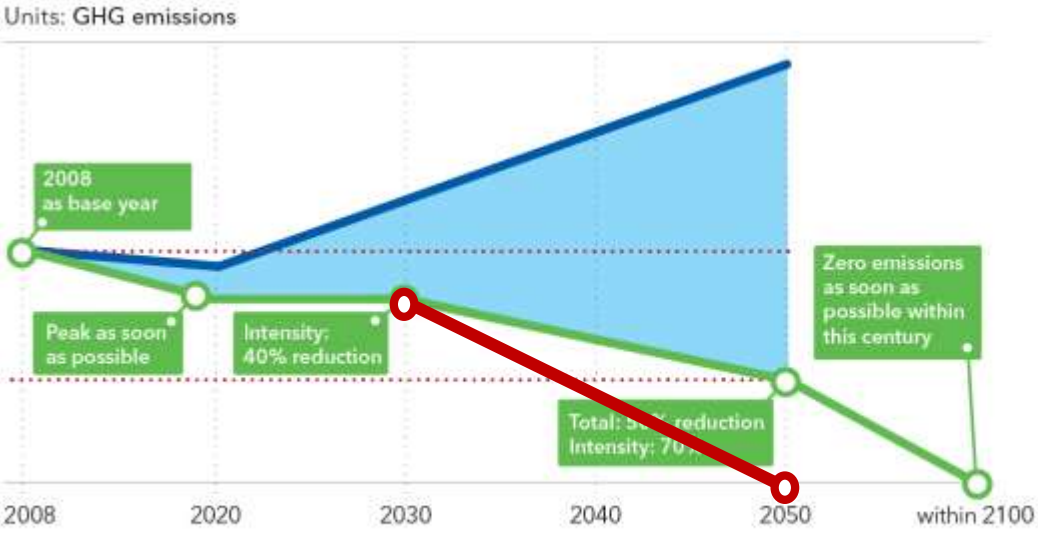


Digitalization

- Connectivity
- Automation



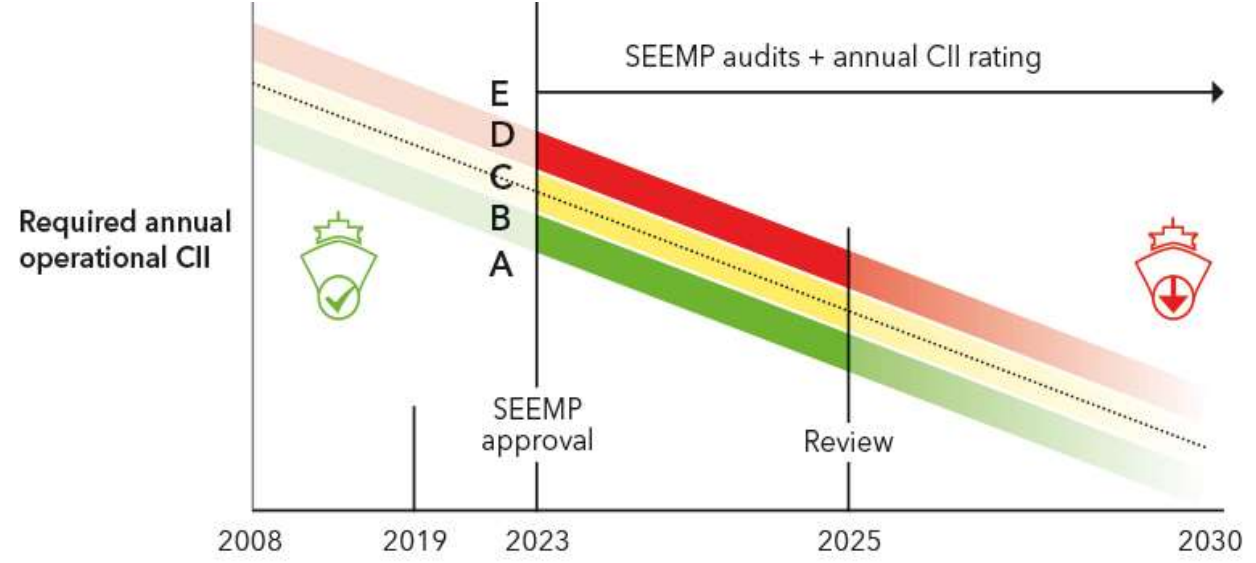
IMO strategy on GHG reductions



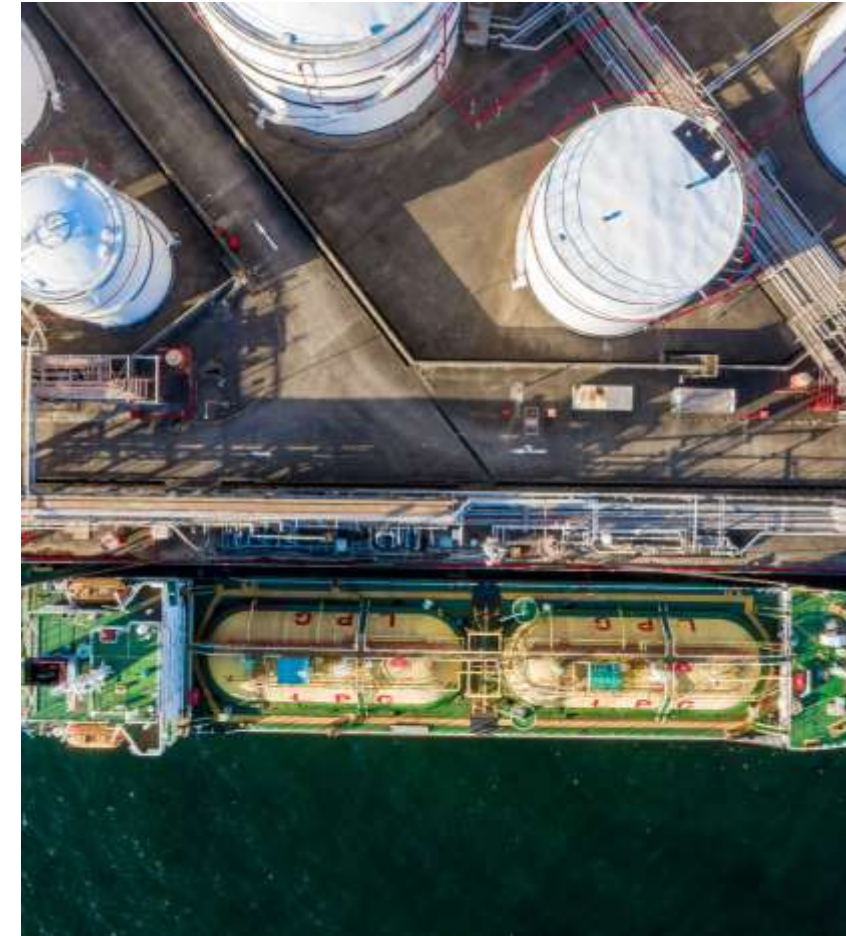
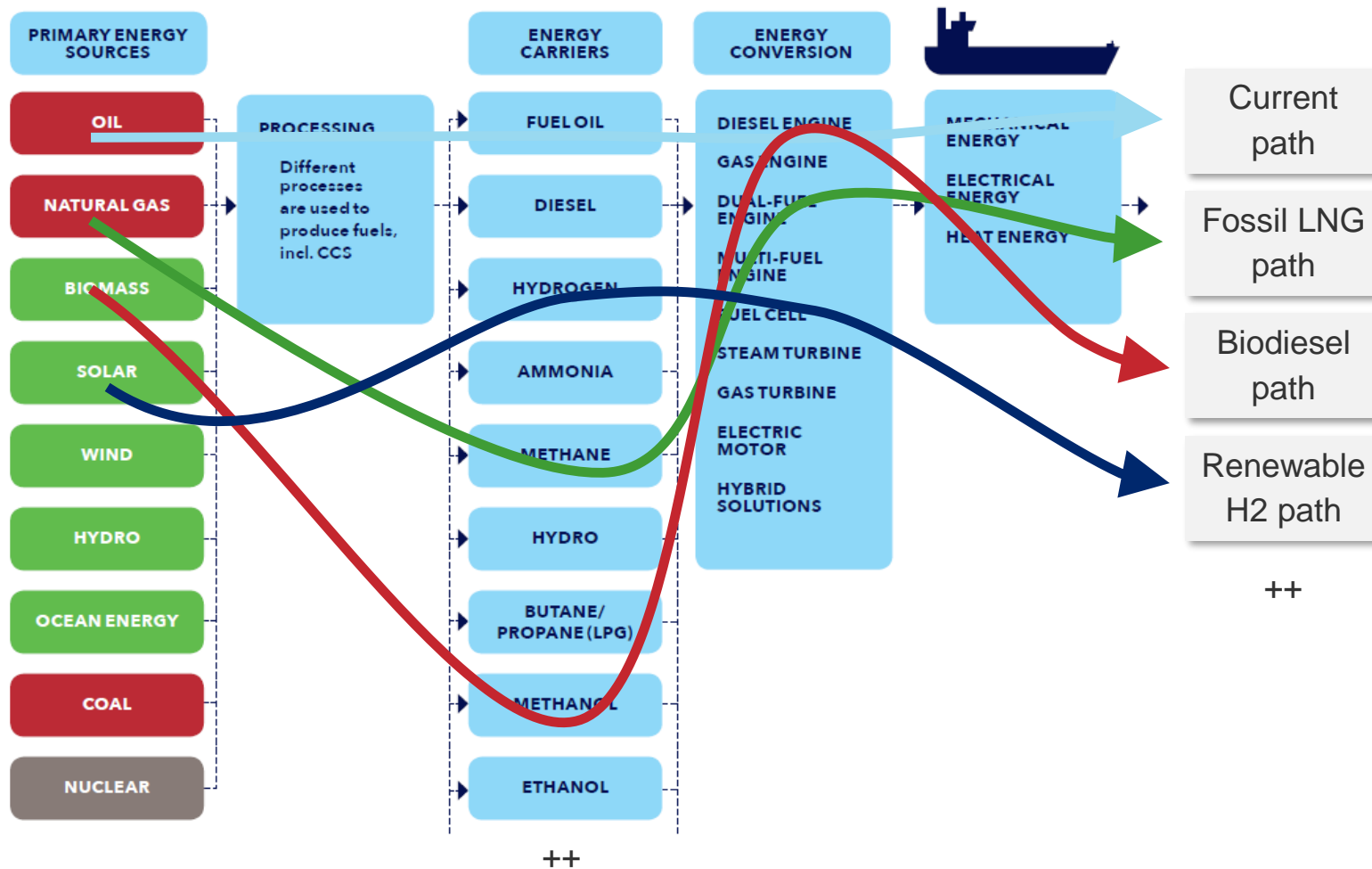
Total: Refers to the absolute amount of GHG emissions from international shipping.
Intensity: Carbon dioxide (CO₂) emissions per unit of transport work.

**Revision in 2023:
100% decarbonisation
by 2050?**

- Emission pathway in line with IMO's GHG strategy
- Business-as-usual emissions*
- Emission gap

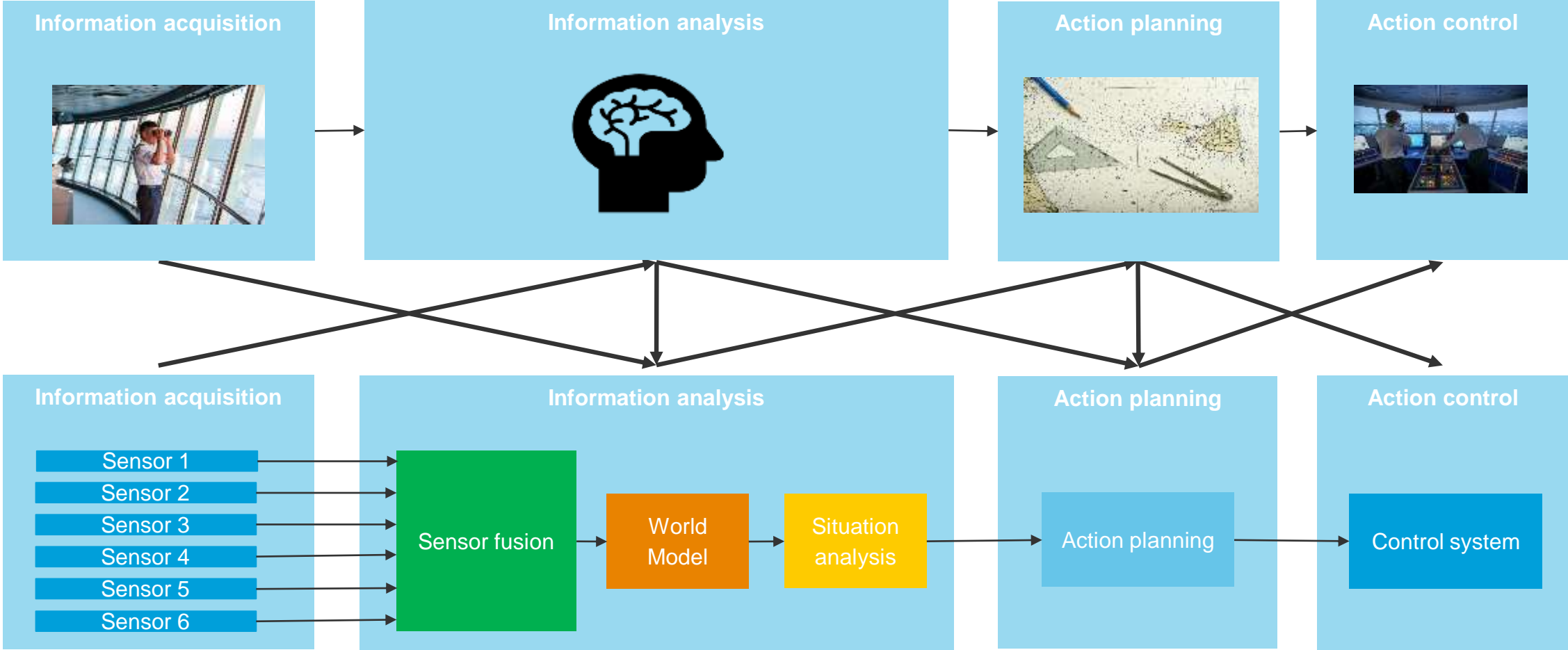


Alternative fuel paths & Fuel-mix uncertainty



Inspired by Brynolf S. (2014), 'Environmental assessment of present and future marine fuels'

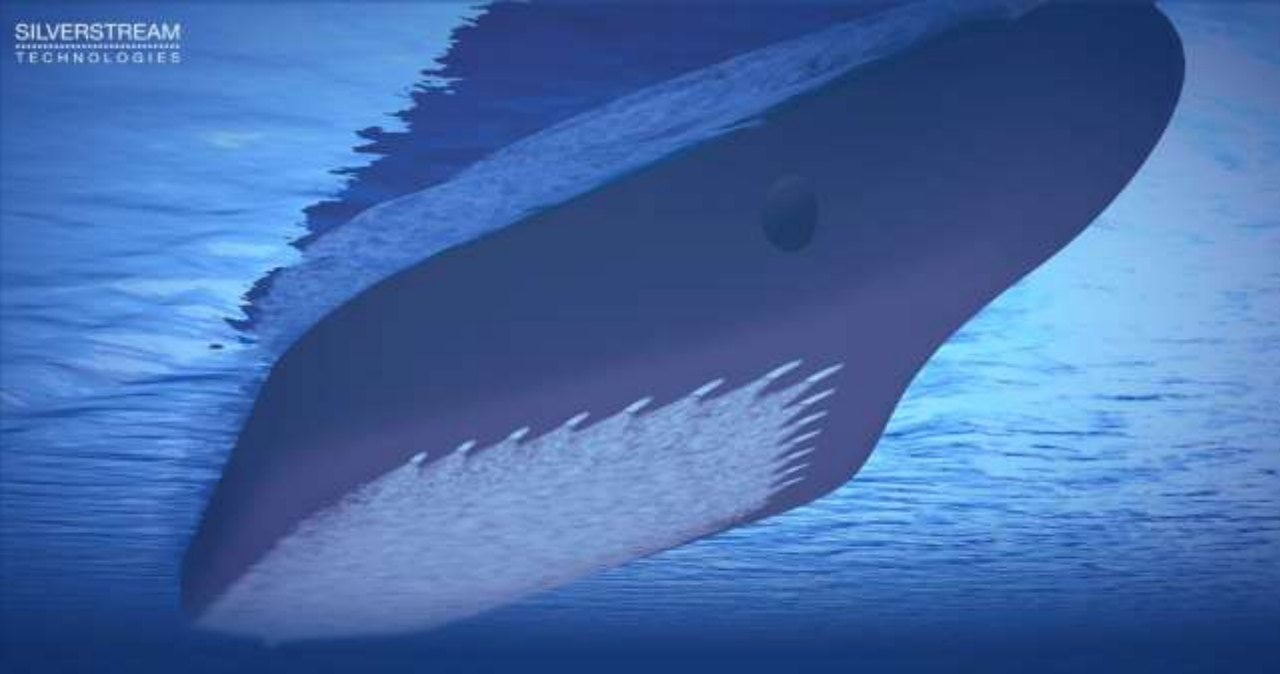
Conventional vs Autonomous Navigation



Ship design in 2035

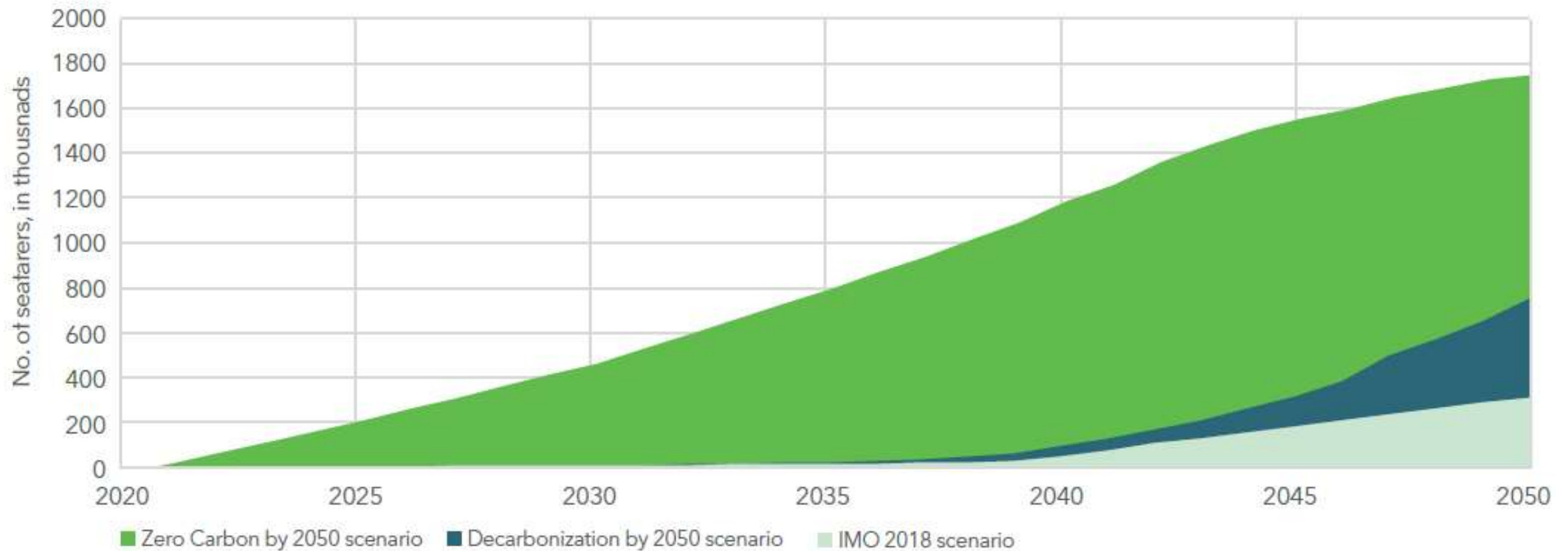
...the rule rather than the exception





As shipping decarbonize, training of seafarers must happen in parallel

Estimated number of seafarers working on board ships equipped with alternative fuel technologies, all scenarios



A new set of seafarer skills

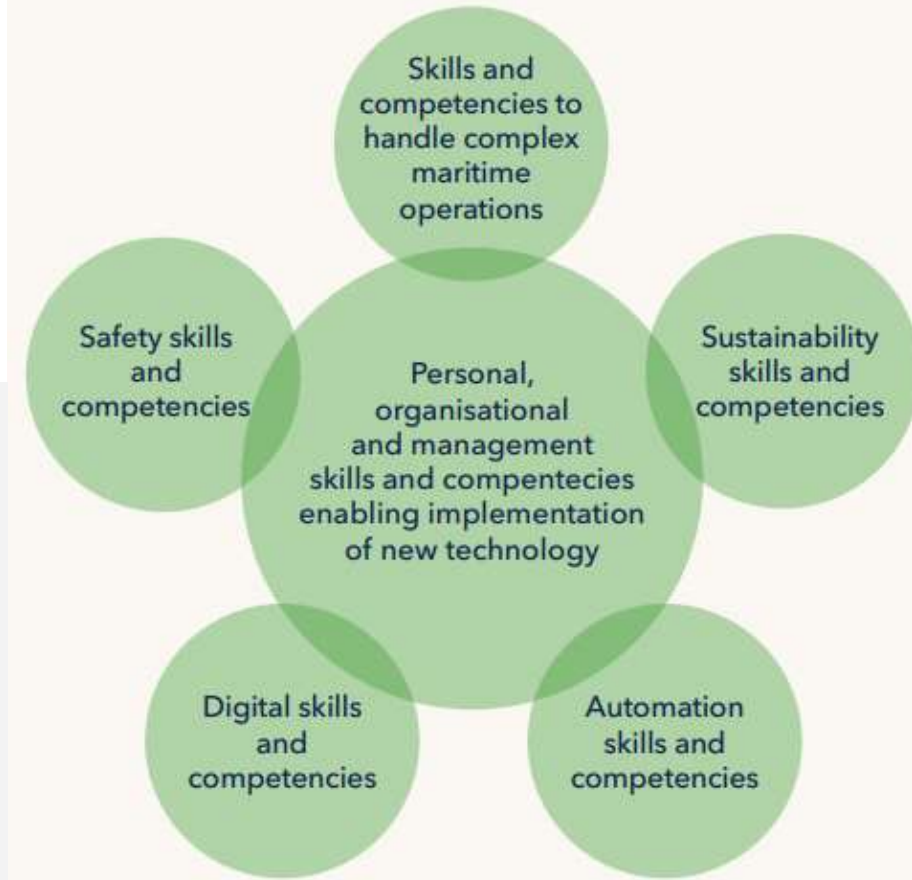
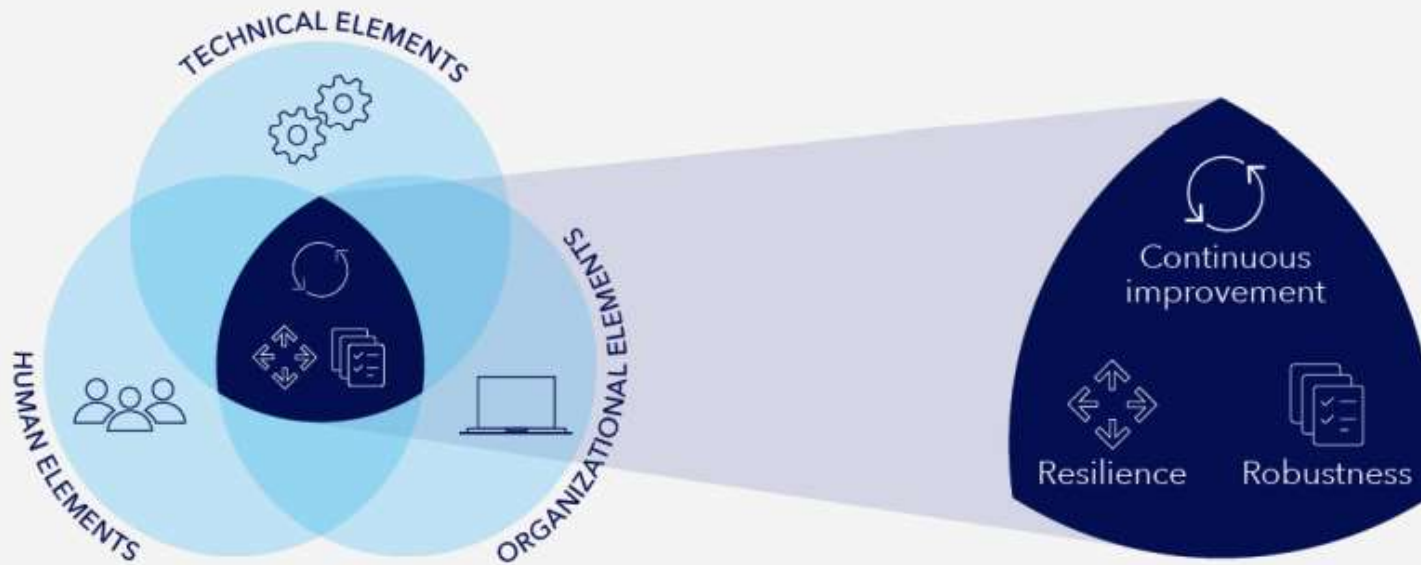
- Uptake of alternative fuels include new **technological** and **safety** challenges onboard.
- Digitalization and automation will follow, possibly **reducing** the number of crew onboard, but not the need for **seagoing experience**.
- The added complexity points toward a need for “**higher-skilled**” seafarers with “**strong safety culture**”



The future seafarer

DNV HOT approach to safety

Interactions and properties of a safe maritime system



Thank you

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