

»» Decarbonizing cruise ships

Dekarbonisierung der
Kreuzschifffahrt

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*Zero Emission Shipping
Symposium
- Hamburg, 25 June 2025*

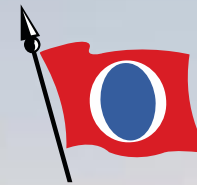


Part of Carnival Corporation & plc,
a tourism company with some of the
world's leading cruise lines.

Eight brands under one roof
with a total of 90+ ships

Around 40% global market share
in the cruise industry

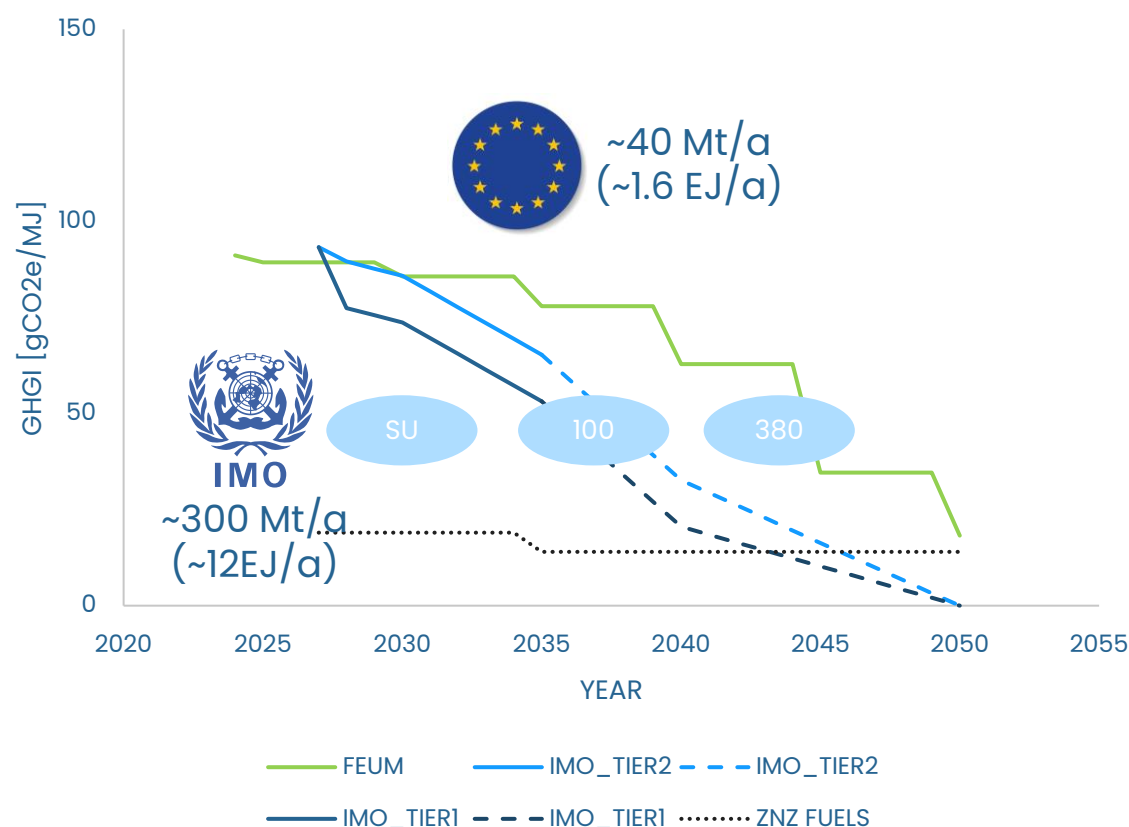
Eight new buildings on order from
European shipyards



CARNIVAL CORPORATION & PLC



By first global CO2 pricing mechanism, IMO rises level of ambition of decarbonisation

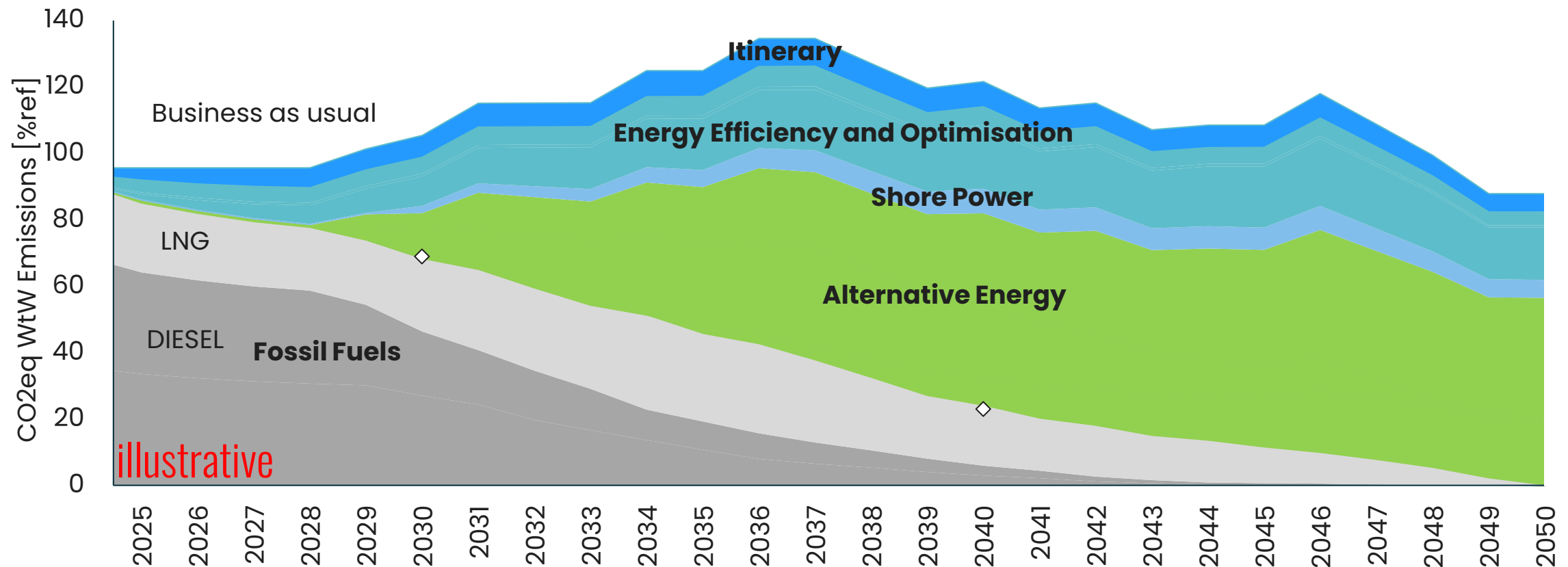


	IMO mid-term measures	Fuel EU Maritime and ETS
Methodology	Combined two-tier approach	Separate schemes for levy and fuel standard
Flexibility	Trading mechanism, limited banking	Pooling and banking for Fuel EU
Sustainable fuel rewards	ZNZ support to be determined	Double counting for e-fuels
Penalties	\$100 and \$380 per ton CO ₂ e	Fuel EU \$700 per ton CO ₂ e ETS market-based abt. \$74
Revenues	IMO Fund – support ZNZ and JET* (tbd)	National budgets with purpose climate action
Ambition	Ambitious reduction 2035: -43% in GFI 2040: -65% in GFI	Moderate reduction 2035: -14.5% in GFI 2040: -31% in GFI

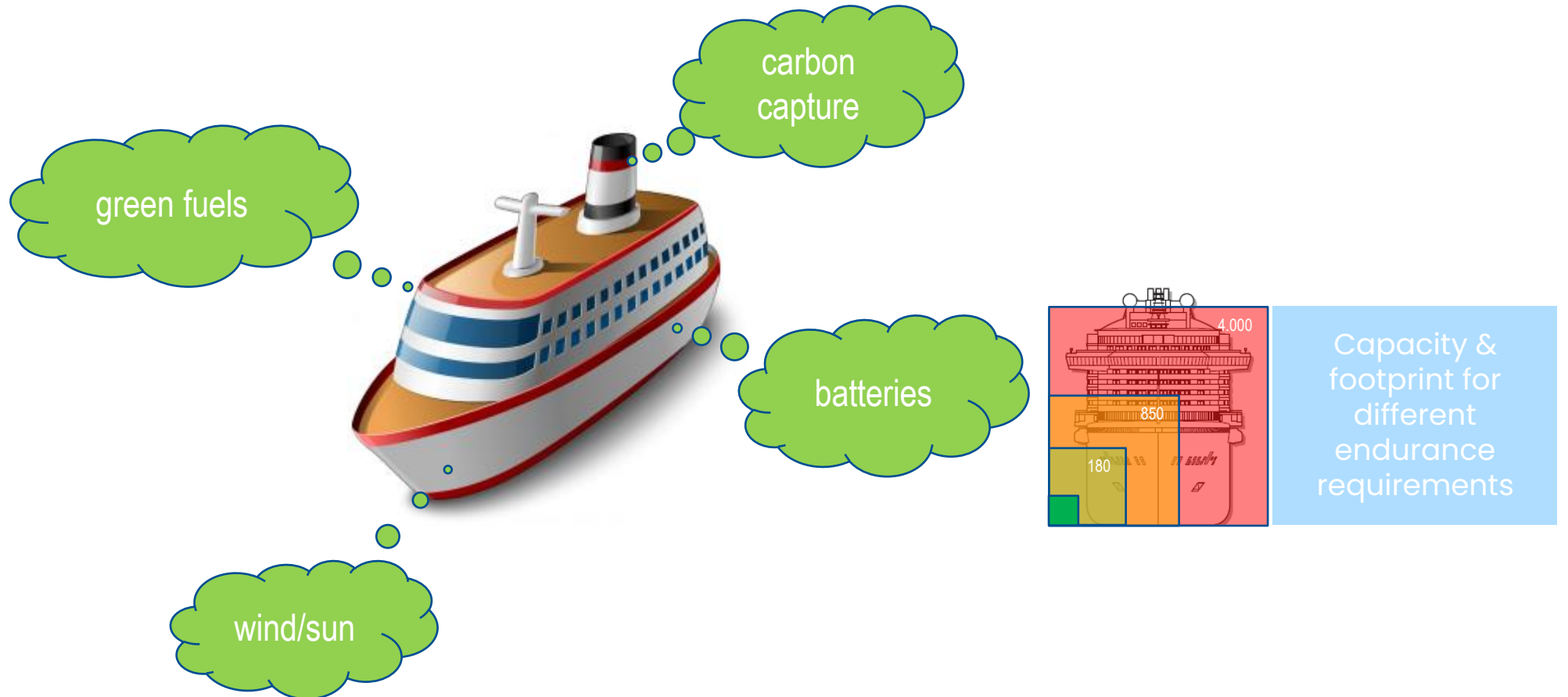
ZNZ: Zero, or Near Zero fuels

JET: Just and Equitable Transition

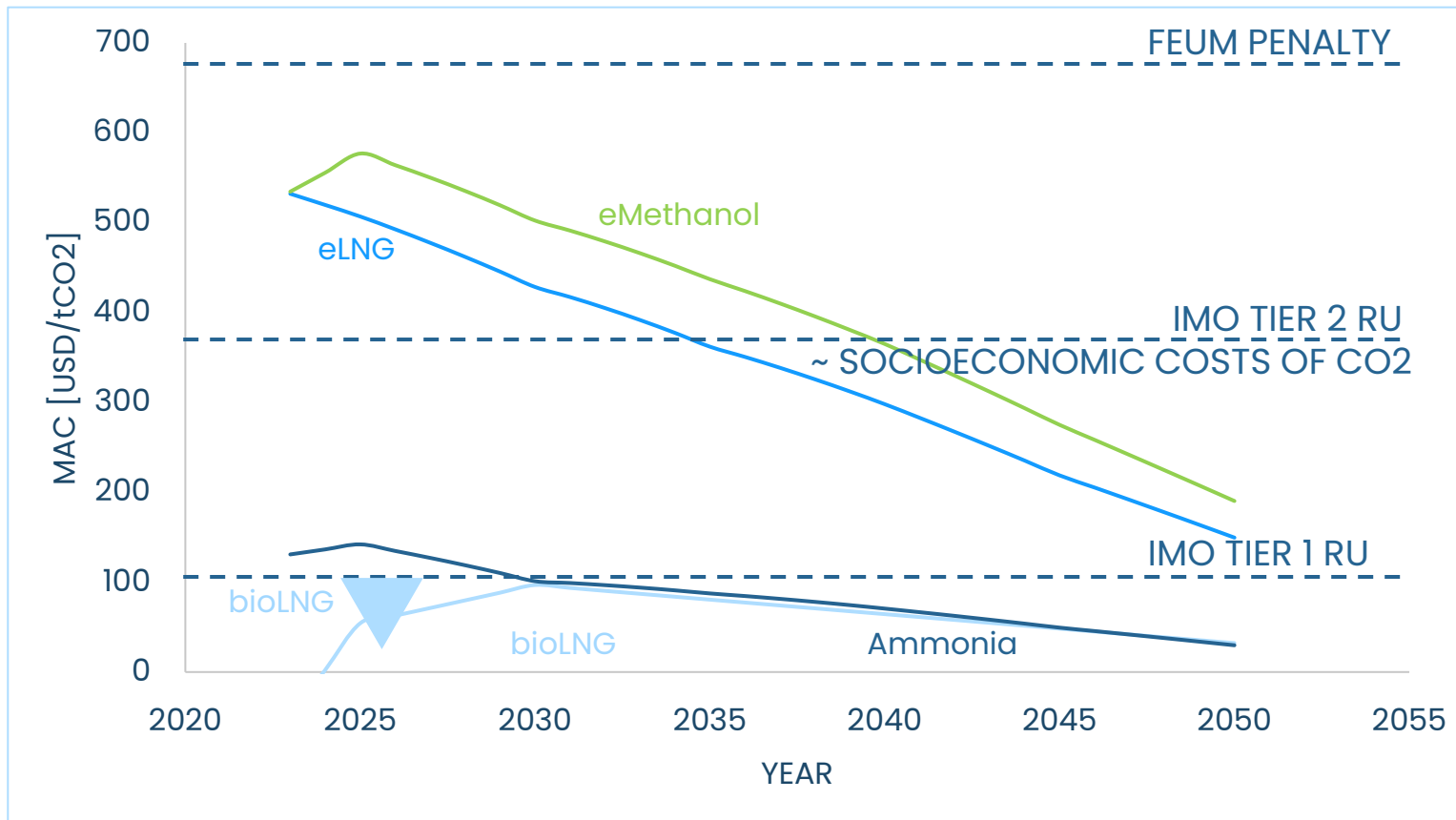
Road to GHG neutrality: Energy efficiency is key for today – alternative energy sources will become the large lever



Cruise ships are hard to electrify – while many technologies can support decarbonisation, green fuels are the most promising solution

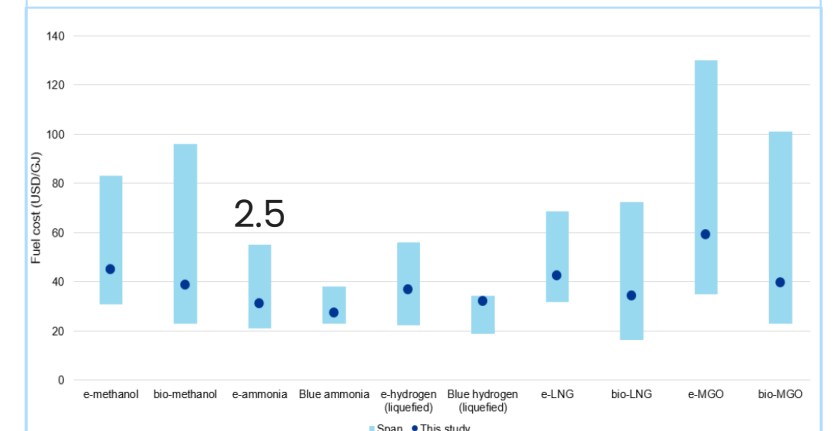


Starting with LNG, bio-LNG (& Ammonia) seems to be the most economic future pathways, however future is uncertain

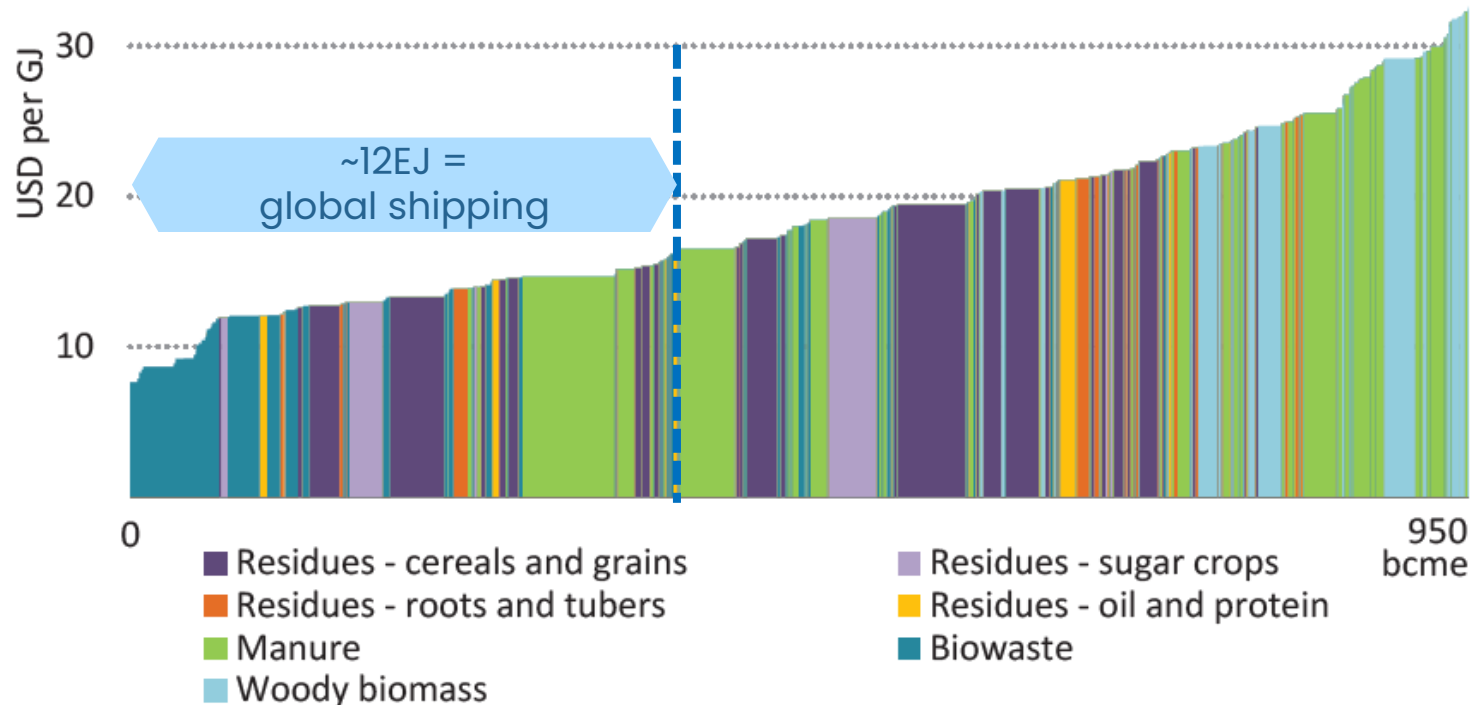


Based on MMCZCS forecast:

- LBM seems most economic pathway
- E-Fuels higher Marginal Abatement Costs than IMO T2 RU till ~2035
- Double Counting & Zero and near Zero fuels support might change the picture
- High uncertainty in fuel cost prediction



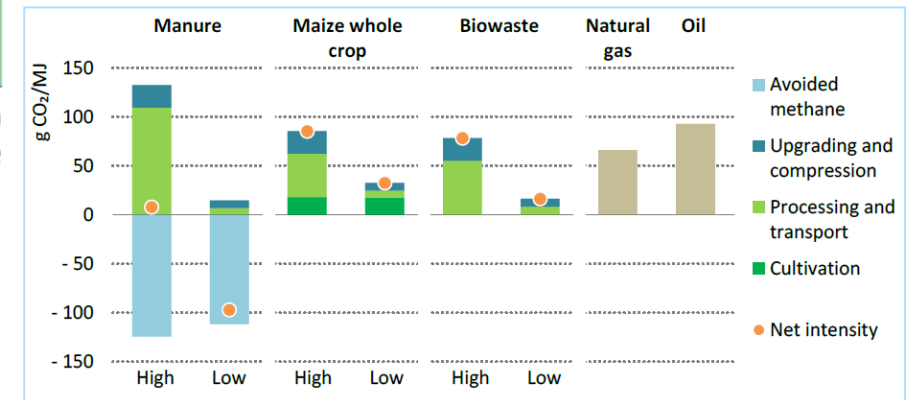
Energy potential of biogas is sufficient to supply shipping - However, sustainability concerns must be addressed



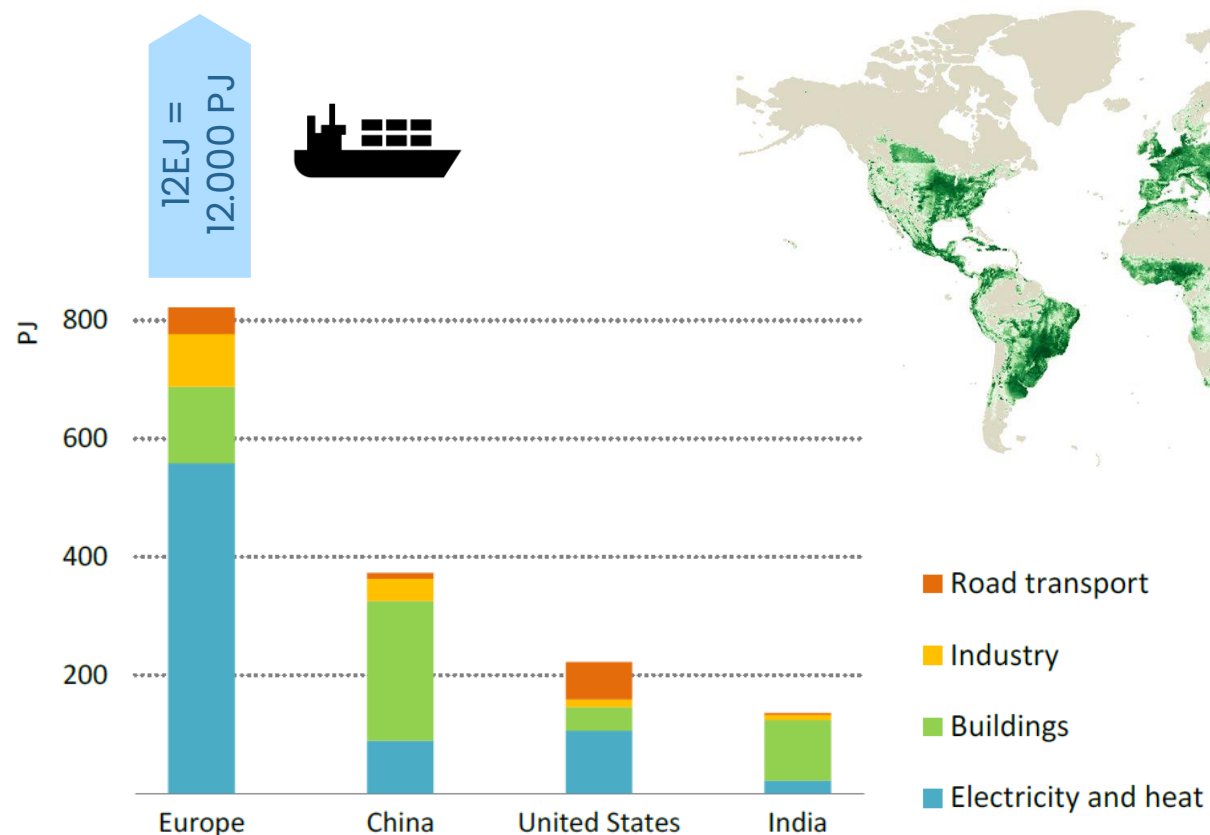
MAC ~ 80 USD/t
(depending on GHGI of product)

Challenges:

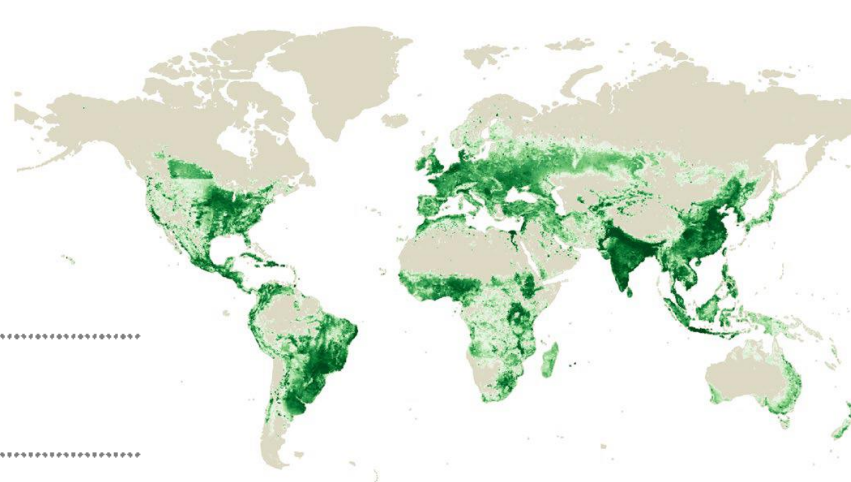
- ILUC (Indirect Land Use Change)
- GHGI of pathways
- Biodiversity



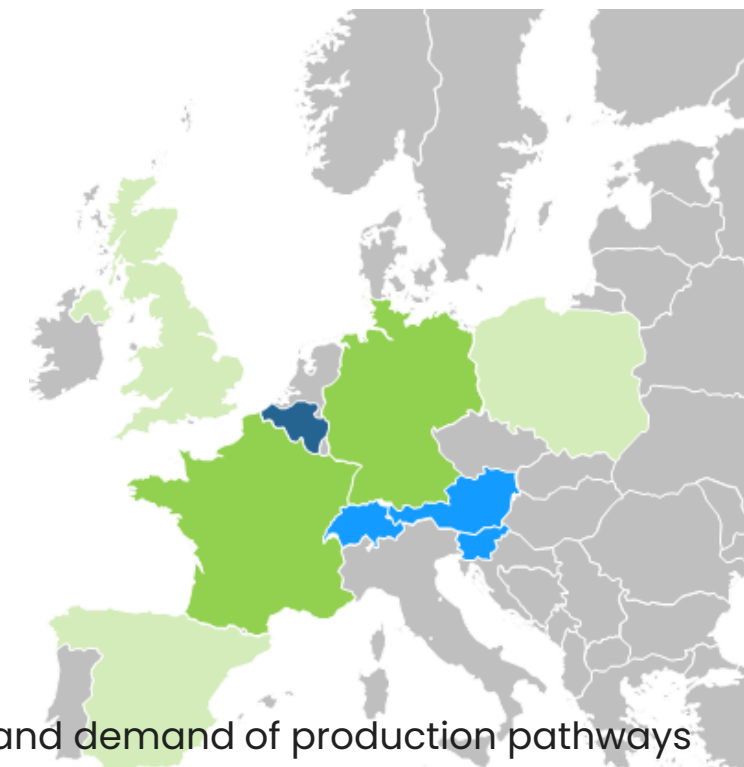
Exploiting full biogas potential will have a significant global footprint impact, sustainability KPIs need to be transparent & reliable!



Source: IEA 2025



Source: IPCC 6



Land demand of production pathways

e-fuel via
PV

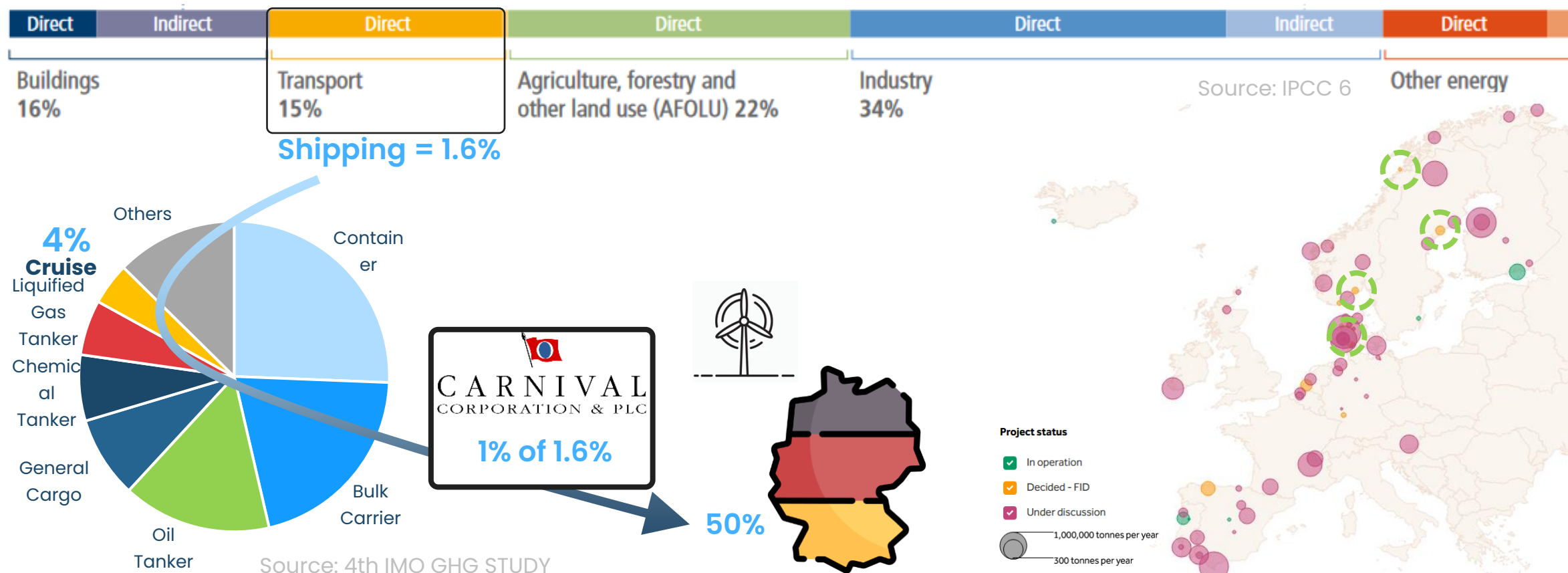
e-fuel via
Wind

biogas via
Corn

Source: Own calculations

27/06/2025

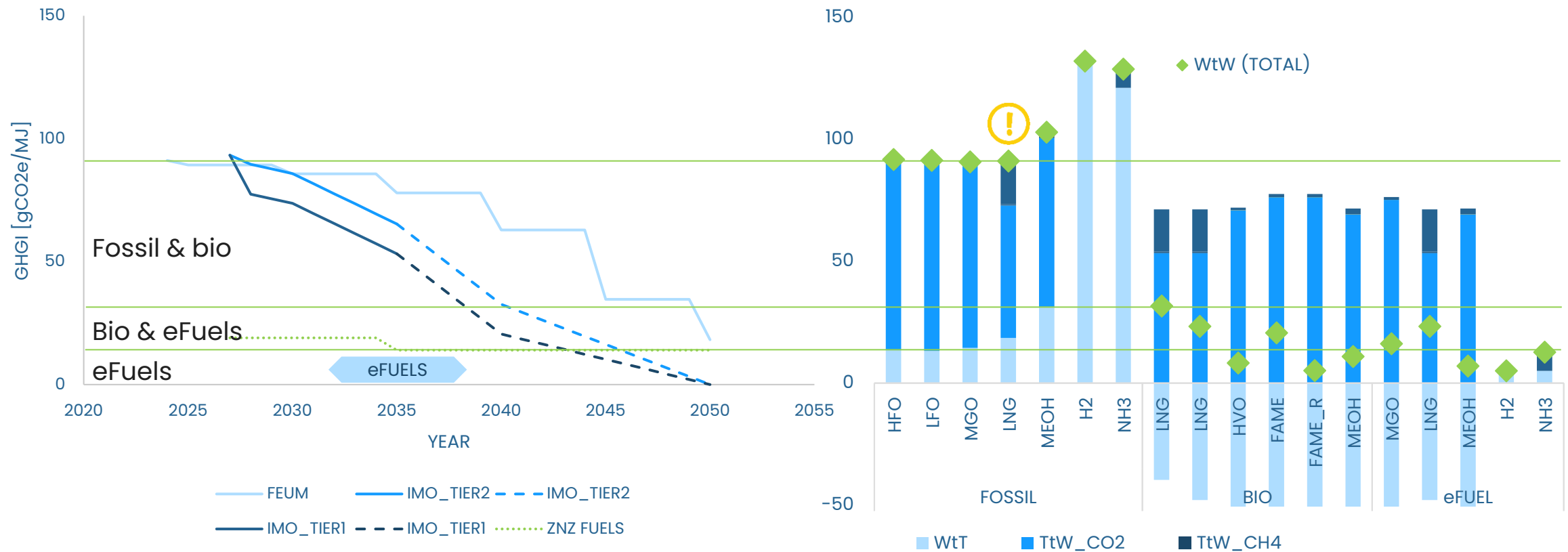
Significant investment in eFuel production is needed, uncertainty has led to delayed ramp-up of production



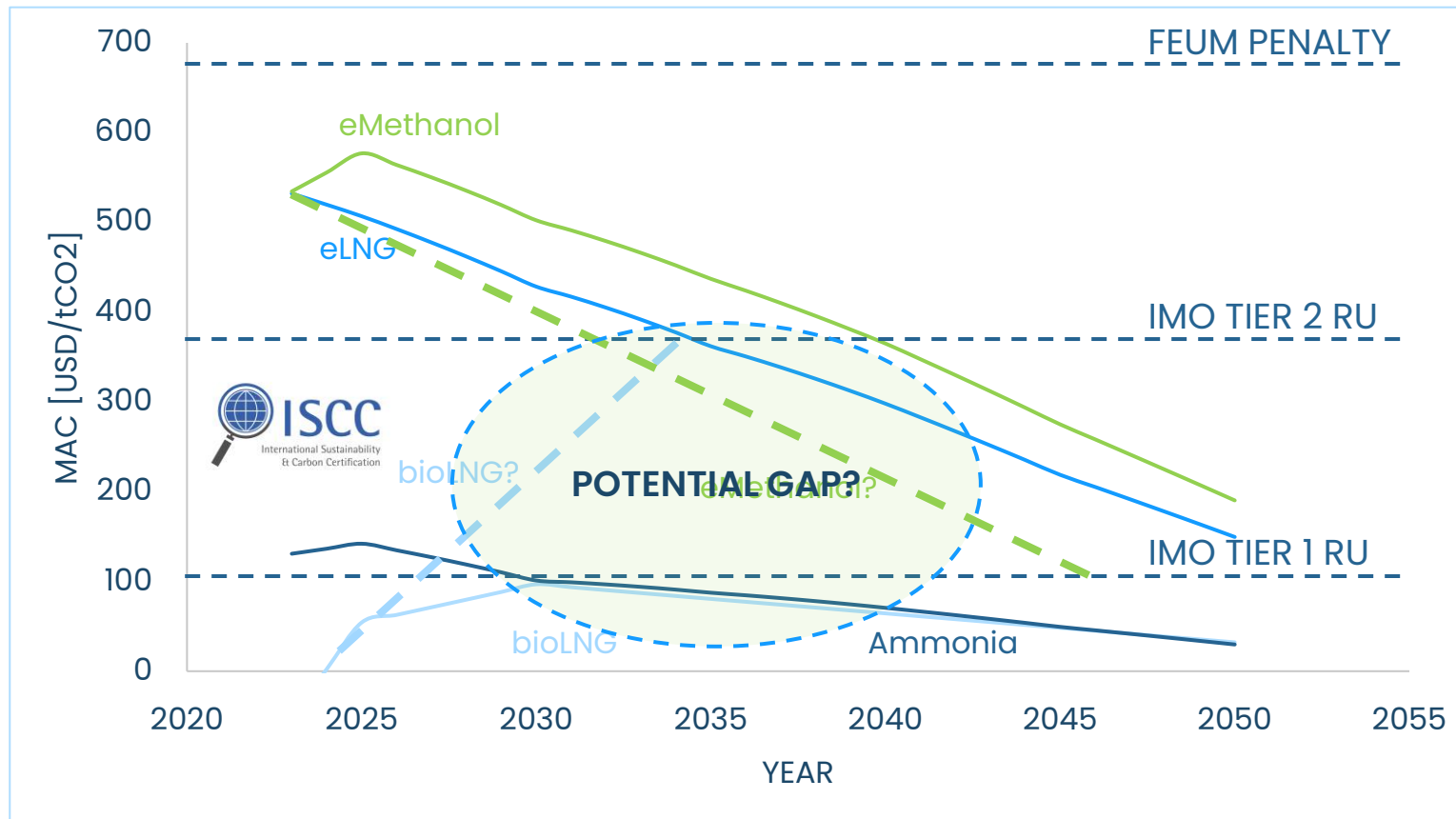
Source: T&E E-Fuels observatory

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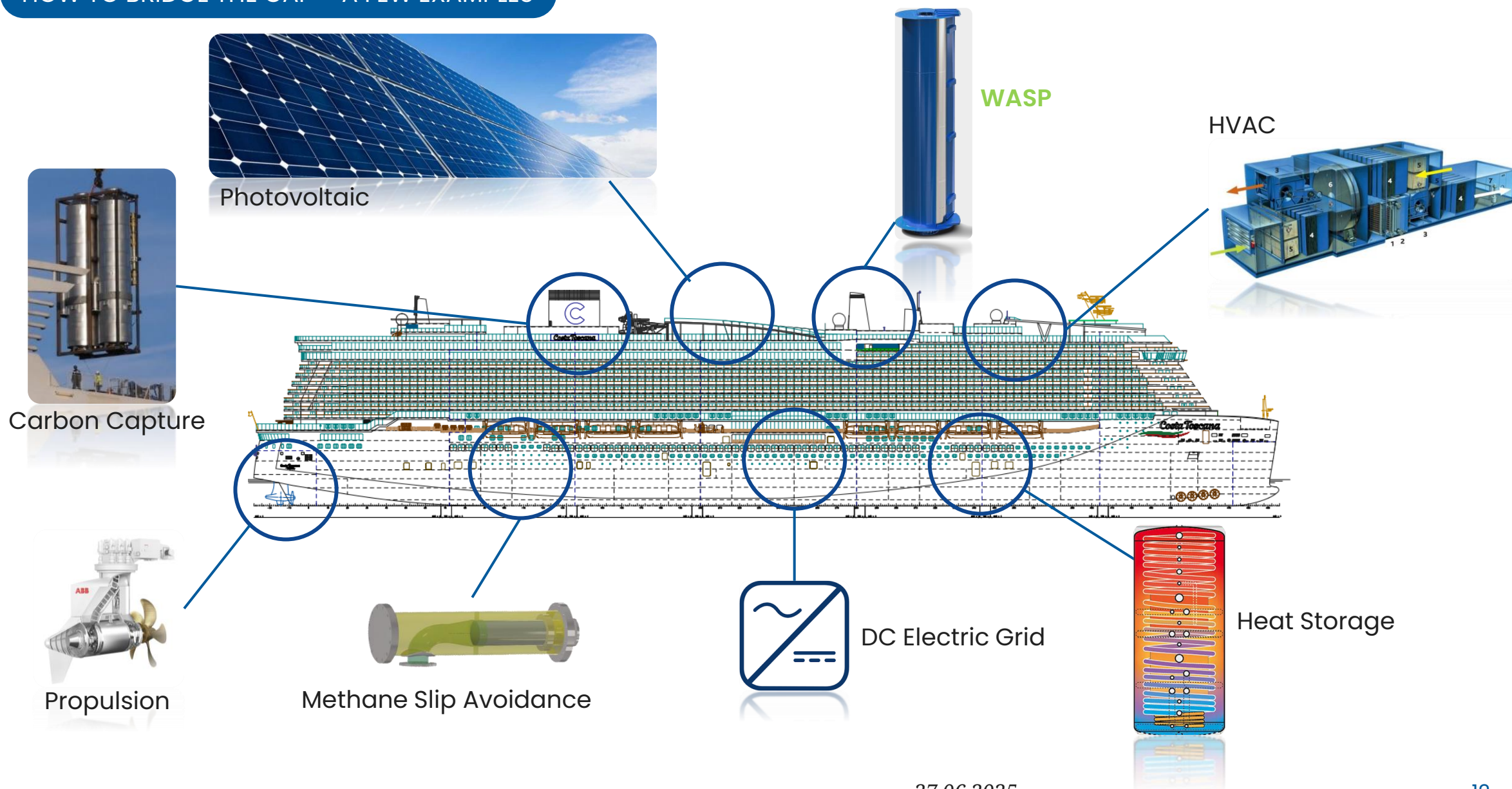
Looking into GFI targets and GHGI of fuel pathways, eFuels must enter the global fuel mix from ~2035



Price increase driven by sustainability limitations of biofuels could trigger investments in eFuels pulling ahead a price equilibrium



HOW TO BRIDGE THE GAP – A FEW EXAMPLES



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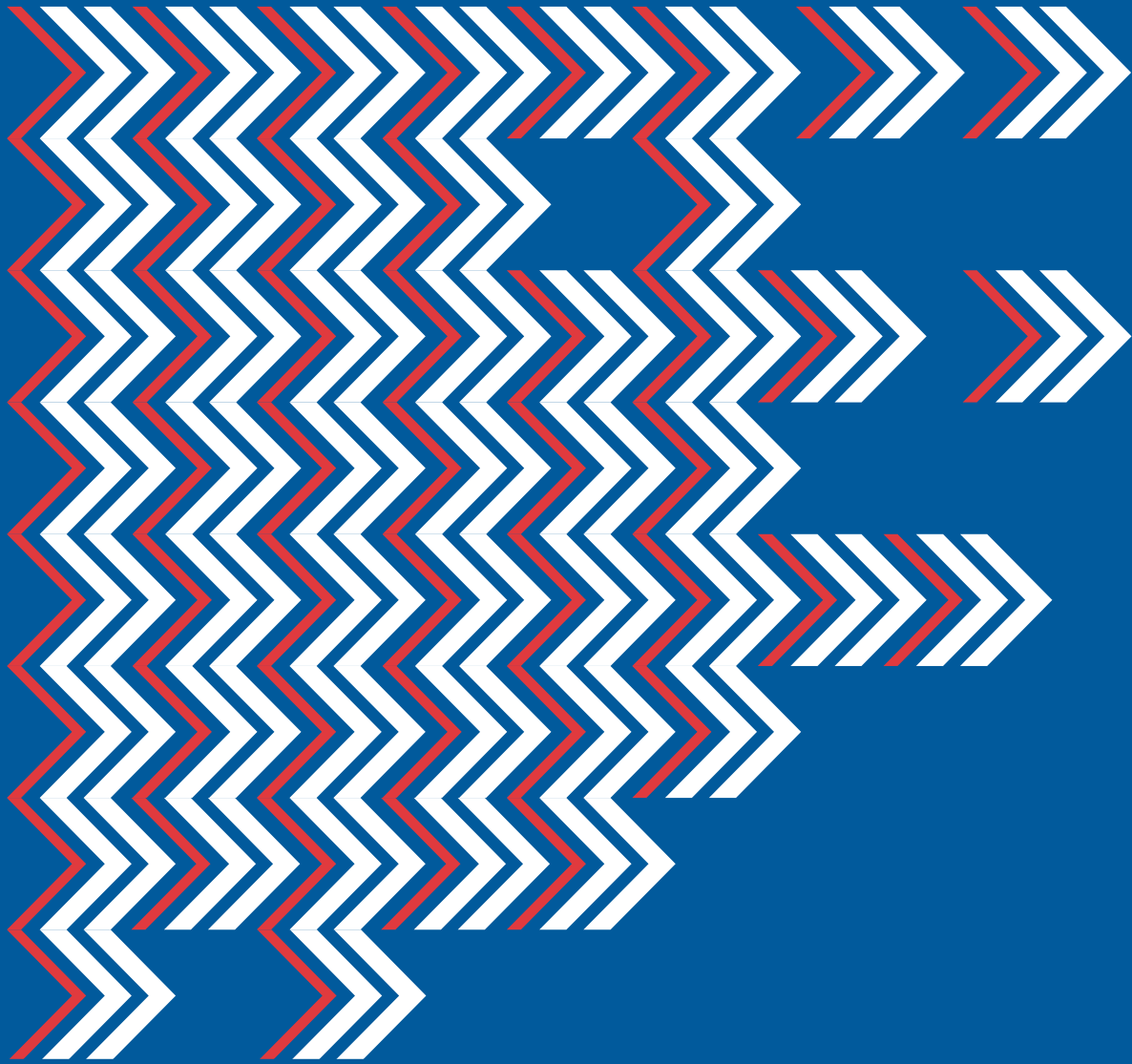
Uncertainties in future fuel scenarios need to be addressed to unlock the right investments into the green transition

➤ **Close the price gap between bio and efuel**

- Alignment of EU and IMO regulation for clarity of scenarios (Ambitions, CCS, GFS)
- Alignment & reliability of sustainability criteria
- Bridging the price gap (Contracts for difference / Book & Claim)

➤ **Support innovation in energy efficiency**

- Funding & supporting innovations (e.g. running fuel cells in zero emission TNT ports)
- Support OPS



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Thank You