



Financing 2-degree shipping:

Financing Paris aligned shipping

- International shipping needs to decarbonize. This creates a significant financial risk when investing in ship engine technologies.
- Two possible climate scenarios can be risk assessed:
 - The current IMO GHG ambition which calls for a 50% cut in emissions by 2050 (Base case)
 - A higher IMO ambition which is aligned with The Paris Agreement, which calls for a 70% cut by 2050 (High case)
- Through GSP, KLP and DNB together with other partners has done a study on the financial risk these two scenarios represent for different ship engine technologies. I will in this presentation go through the results from the VLCC segment.



Focus of the study

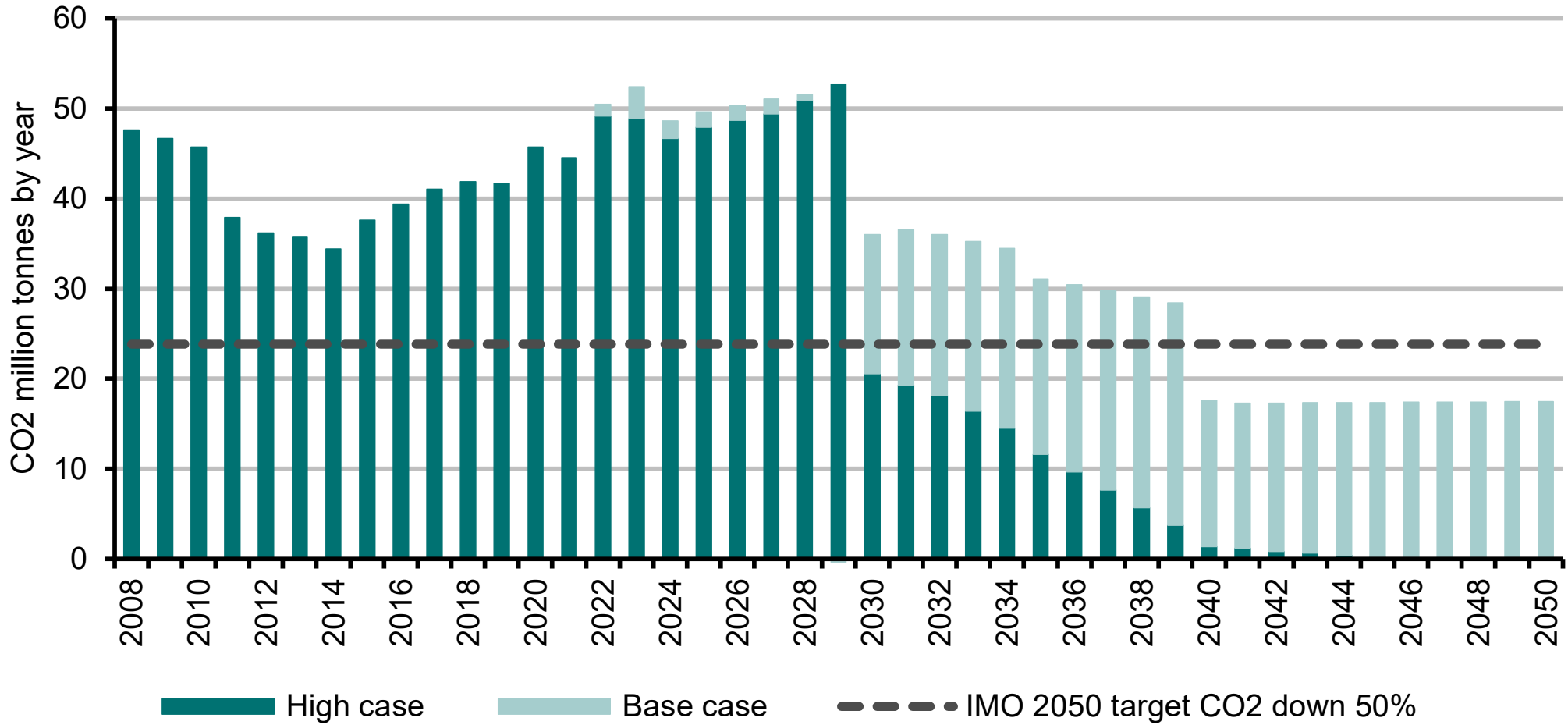
- Financial scenario modelling of two climate scenarios, the IMO ambition for decarbonisation (base case) and a Paris aligned decarbonisation scenario (high case)
- The study has focused on three main shipping segments, VLCC, Capesize and container (10 000-TEU)
- Other than internal combustion engines powered by diesel/HFO/VLSFO the study has focused on LNG and ammonia as probable fuel alternatives, both for use in ICE technology. Hydrogen and batteries has not been assessed as economic viable options for long distance freight.
- The financial modelling includes extensive input of:
 - Engine and vessel investment cost
 - Price curves of HFO/MGO/VLSFO, LNG, Ammonia, CO2 and blending fuels
 - Present and expected regulation of the marine industry

The study has included current planned and expected regulation from the IMO, including blending requirements

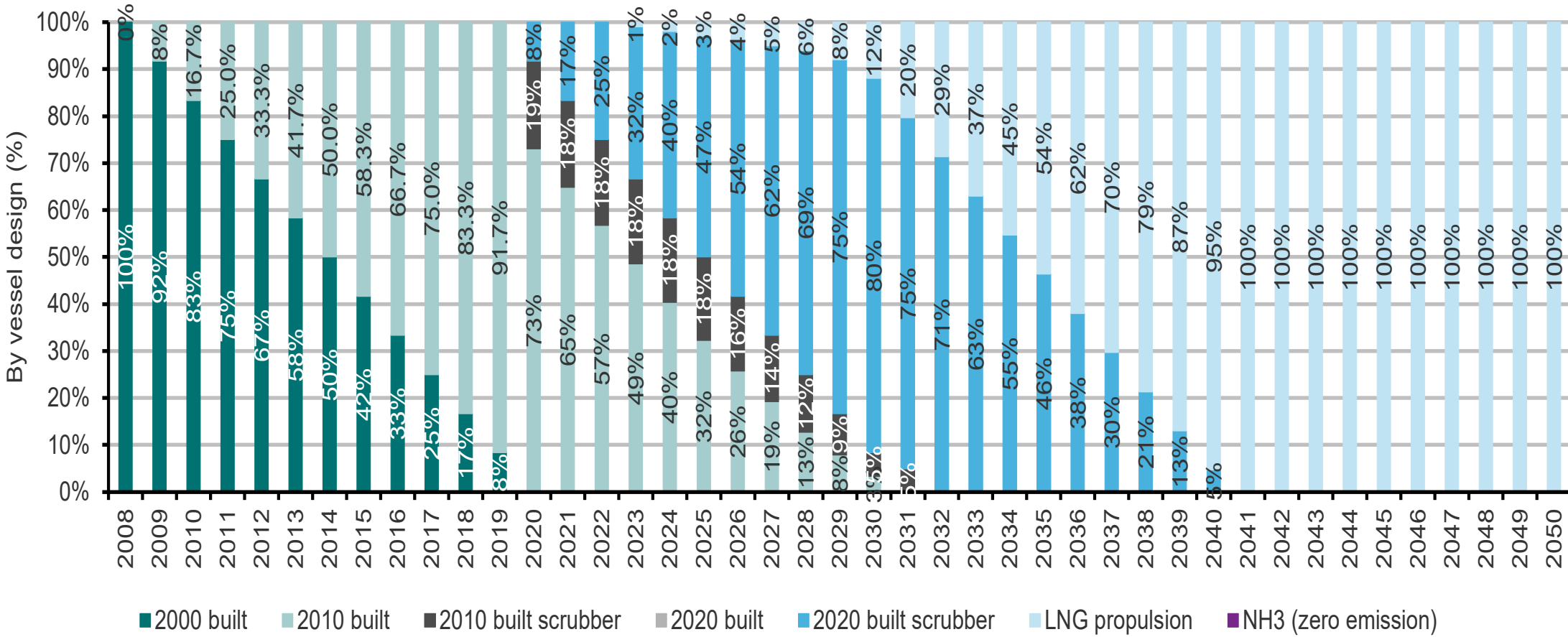
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	
Energy Efficiency Design Index (EEDI)	VLCC	20%			30%			40%																		
	Capesize	20%			30%			40%																		
	10k TEU	20%	40%																							
Energy Efficiency Existing Ship Index (EEXI)	VLCC				20%			40%																		
	Capesize				20%			40%																		
	10k TEU				40%																					
Carbon Intensity Indicator (CII) & Super SEEMP		Grading system to reference line																								
Emissions Trading System (ETS) or other market-based mechanisms												Carbon pricing														
Blending requirements for carbon neutral fuels												20%					25%					50%				



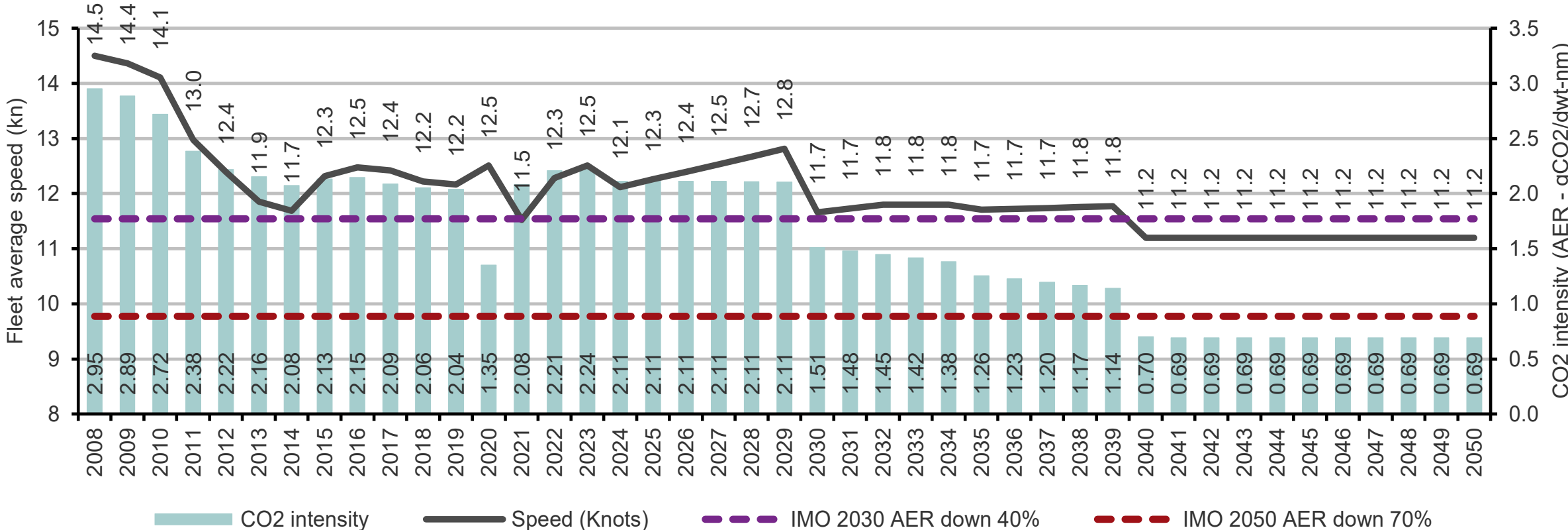
VLCC modelling results: Fleet CO2 emission in high and base case



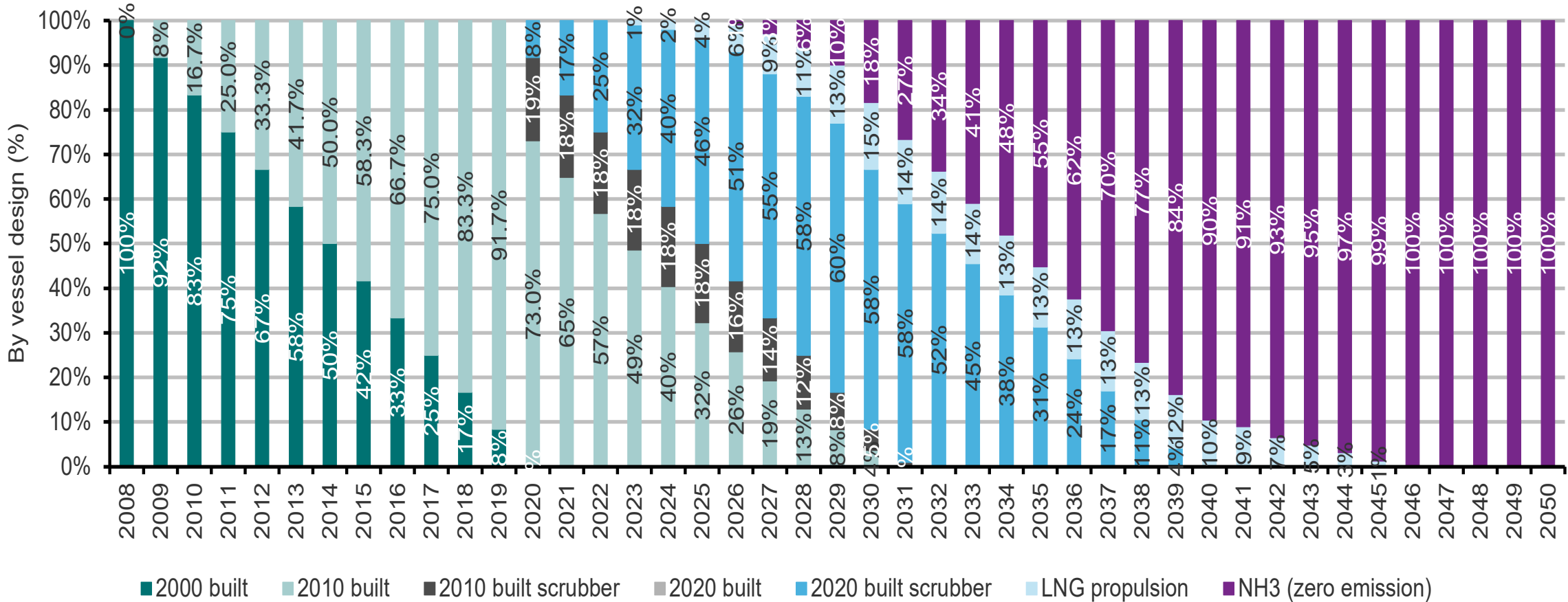
VLCC base Case: Fleet engine technology development, LNG takes over as dominating technology



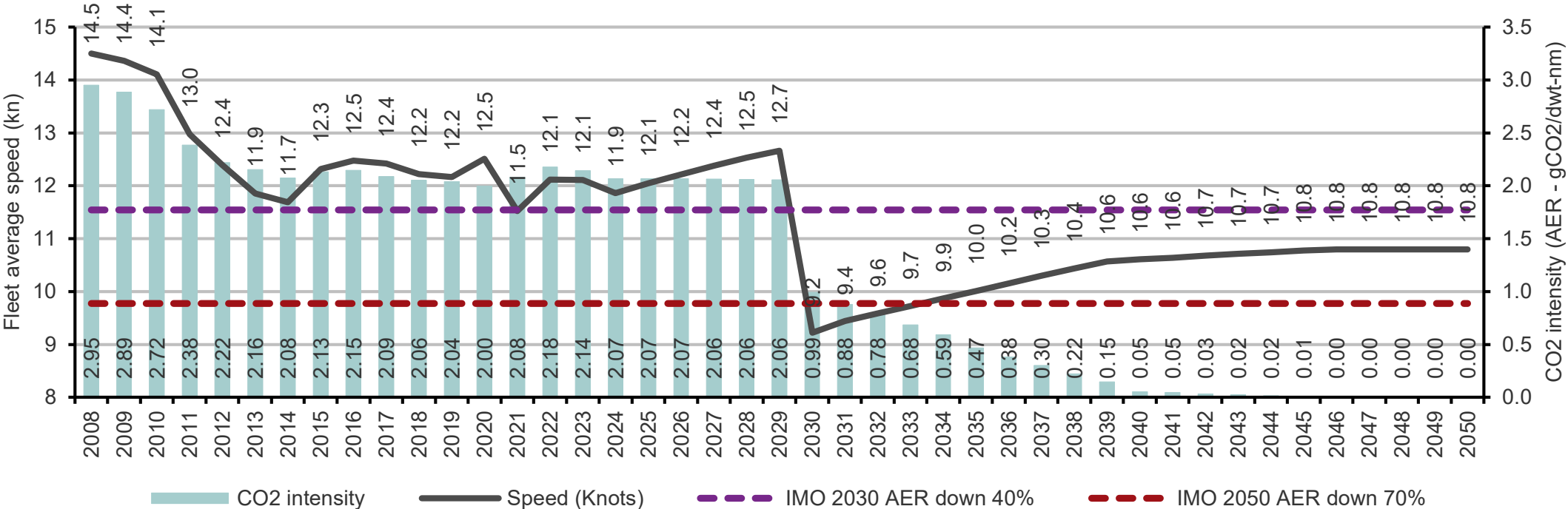
VLCC base case: Total VLCC fleet CO₂ emission, blending and CO₂ price important to reach targets



VLCC high Case: Fleet engine technology development, ammonia takes over as dominating technology



VLCC high case: High CO2 prices forces fleet speed down, fossil fuels are forced out of the fuel mix



VLCC: Significant financial risk on conventional ship engine technologies under the high scenario

