

SHIPBUILDING TRENDS – IMPACT ON FLEET RENEWAL & FUEL LANDSCAPE

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- iii. Trend Of Newbuilding Prices
- iv. World Fleet Age Profile
- v. Development of Active Chinese Shipyards

Alternative Fuels Mapping

	VLSFO (benchmark)	Methanol	Ammonia	LNG	HFO & Scrubber	CCS
Vessel CAPEX	1	1,1~1,2 (e.g Kmax +8 mio \$)	1,2 (?)	1,15~1,25 (e.g Kmax +9 mio \$)	1,02~1,05 (e.g Kmax +2 mio \$)	1,2~1,3 (?)
Vessel complexity (NB & Operation)	small	medium	high	medium	small	high
Changes on NB scope (overview)	-	Design, M/E, A/Es, Boilers FSS, Piping, Tanks Nitrogen, Safety related	Design, M/E, A/Es, Boilers FSS, Piping, Tanks, Semi-Cryogenic Nitrogen, Safety related	DF Engines & Boilers FGHS, Piping, Tanks, Nitrogen, Safety related	well proven	Design, extensive scope
Tanks' Capacity	1	2,5	2,8~3,3	1,8~2,2	1	?
Tank-to-Wake GHG	1	0,9	~0,05	0,75~0,85	~1	??~0,7
Well-to-Wake GHG (approx.)	1	Gray = 1,14 Blue = 0,7 Green = 0,05	Gray = 1,5 Blue = 0,4 Green = 0~0,2 (N2O TBA)	Gray = 0,85~0,95 Blue = 0,75~0,85 Green = 0,05~0,15	~1	??~0,7
Fuel cost 2025 USD/GJ (est.)	10~15 (=420~630 \$/tn)	Blue = 40~70 Green = 40~?	Blue = 20~30 Green = 30~60	Gray = 10~30 (??) Green = 30~??	7~10 (=300~450 \$/tn)	HFO & Solvents (?)
GHG Compliance Pathway	2030 ✓ (speed red.) 2040-2050 X (need drop in of e- or bio-fuels or CCS)	Gray: X Blue, then Green : 2030-2050 ✓	Gray: X Blue, then Green : 2030-2050 ✓	Gray: 2030 ✓ 2050 ✓ with CCS Green: 2050 ✓	2030 ✓ (speed red.) 2040-2050 X (✓ with CCS)	potentially 2050 ✓, depending on % of CCS
Fuel availability & Bunkering infrastructure	-	Green : low avail. Infrast. can be adapted	Green : low avail. Infrast. challenging due to toxicity	proven, medium avail.	-	-

Alternative Fuels Mapping

	VLSFO (benchmark)	Methanol	Ammonia	LNG	HFO & Scrubber	CCS
General Comments:	-	Widely traded, existing terminal network. Existing infras. for HFO & MGO could be adapted. Liquid at ambient temp. Toxic, corrosive, Flammable	Engines' availability 2025 onwards.. Highly Toxic, Flammable & Corrosive. Liquid at -33oC (1atm)	Volatility on bunker cost. Mature tech. (bunkering infrast, engines' & machinery) Methane Slip (GHG) Liquid at -162oC (1atm)	well proven, Fuel spread attractive, HFO available, need CCS towards 2050 GHG pathway	LNGCs & LNG-fueled vsls ideal first candidates (due to "clean" EG), Carbon Storage Infrastructure & CO2 carriers will play a key role in the CCS value chain

Well-to- Wake GHG Emissions

Ammonia Well-to-Wake Emissions

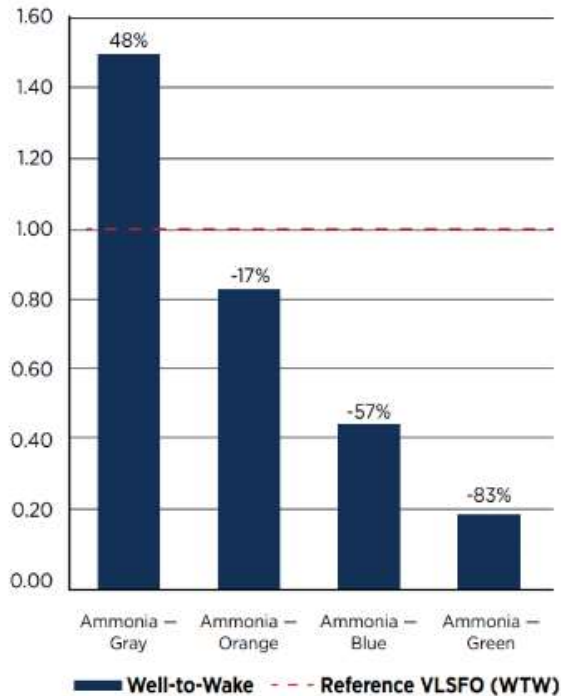


Figure 7: Normalized well-to-wake CO₂ emissions comparison for ammonia.

Methanol Well-to-Wake Emissions

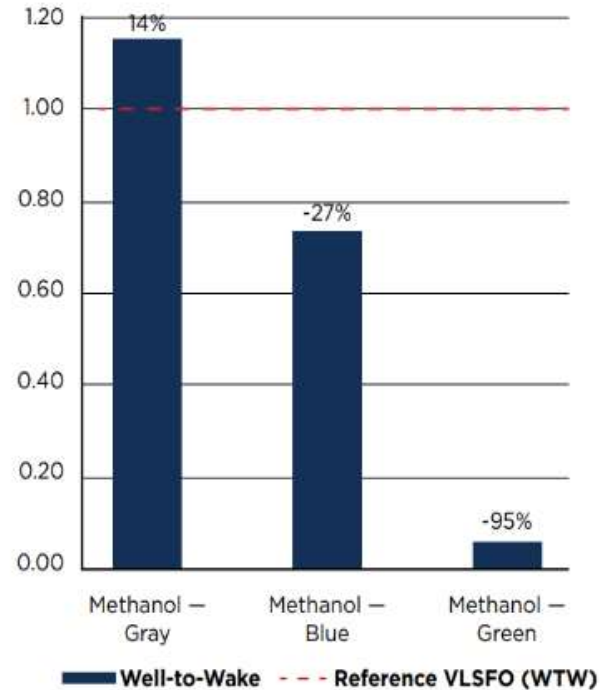


Figure 9: Normalized well-to-wake CO₂ emissions comparisons for methanol.

H₂ Well-to-Wake Emissions

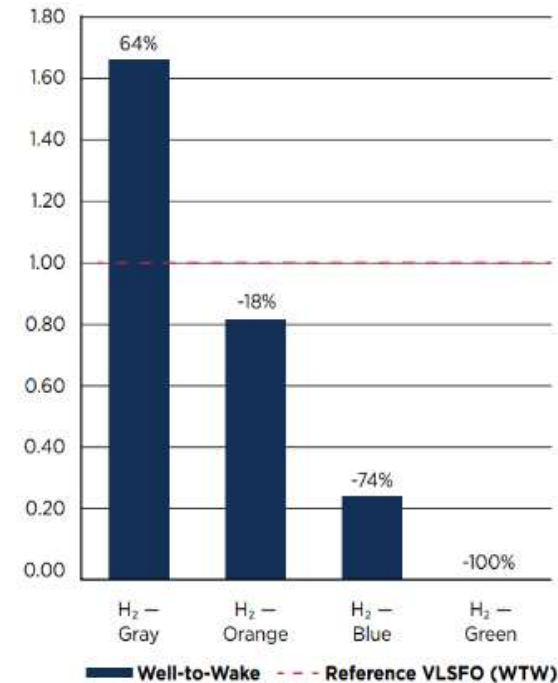


Figure 8: Normalized well-to-wake CO₂ emissions comparison for hydrogen.

LNG Well-to-Wake Emissions

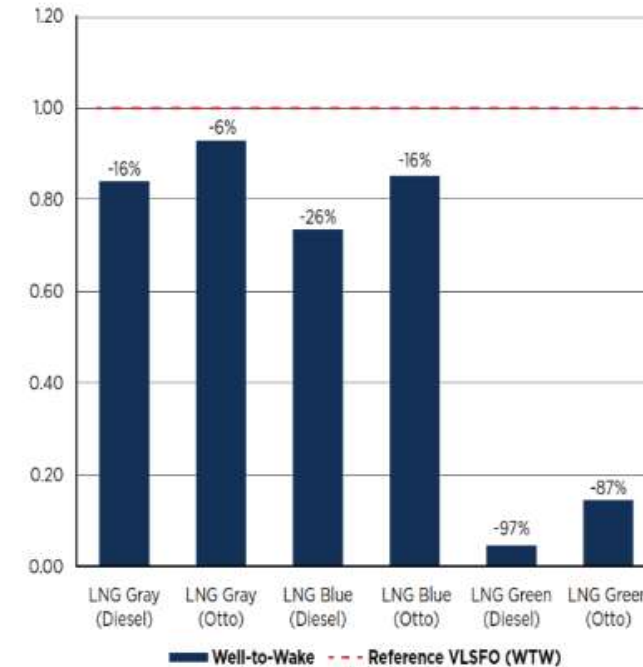


Figure 6: Normalized well-to-wake CO₂ emissions for gray and blue LNG

Tank-to- Wake GHG Emissions

CO₂ Emissions comparison

CO₂ Emmissions with Reference to VLSFO

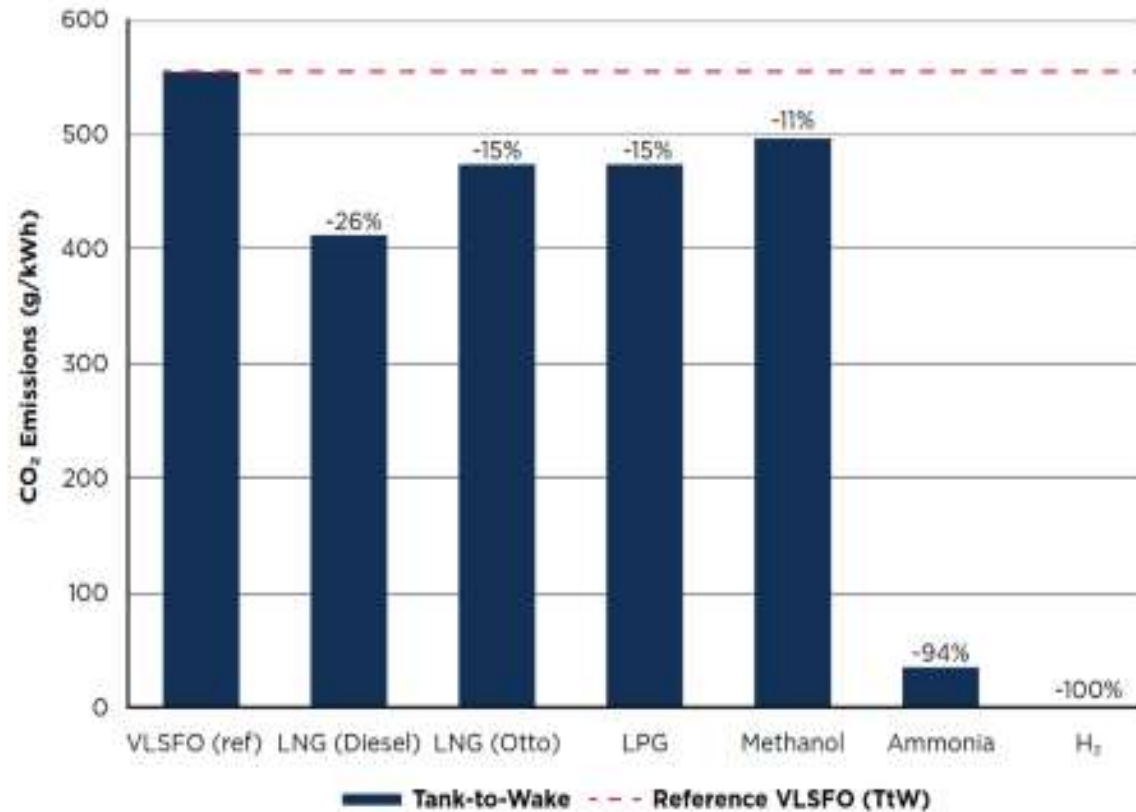


Figure 1: Tank-to-wake emissions of candidate marine fuels.

CO₂ Emmissions with Reference to VLSFO

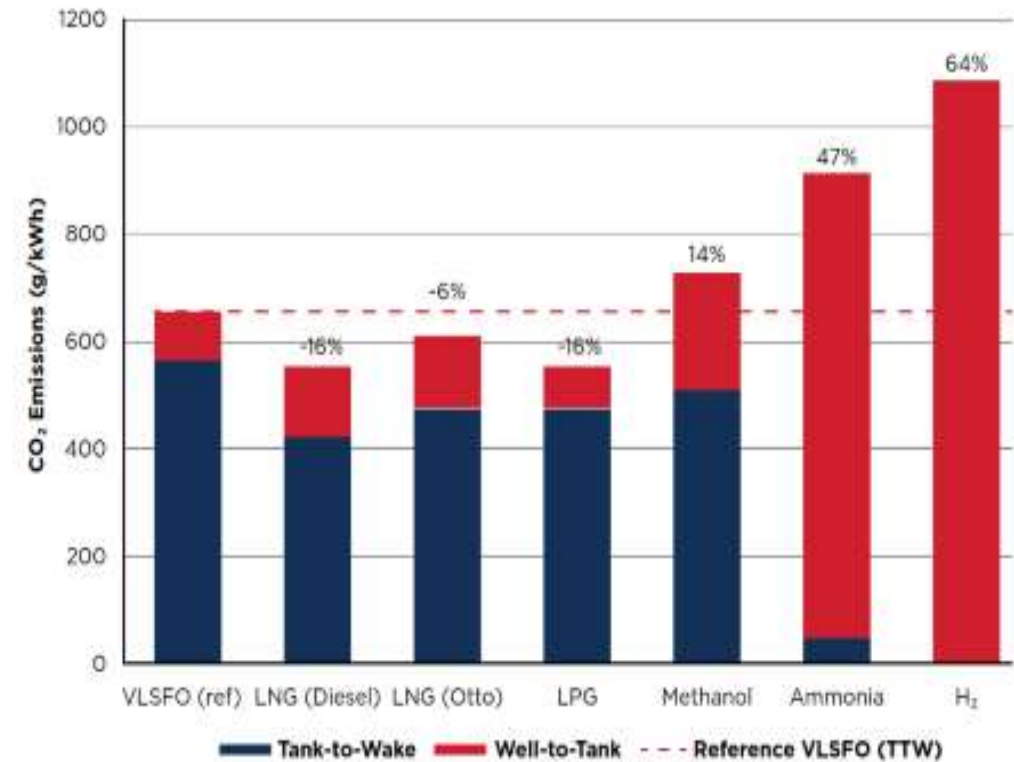



Figure 5: Life-cycle CO₂ emissions comparison between different fuels.

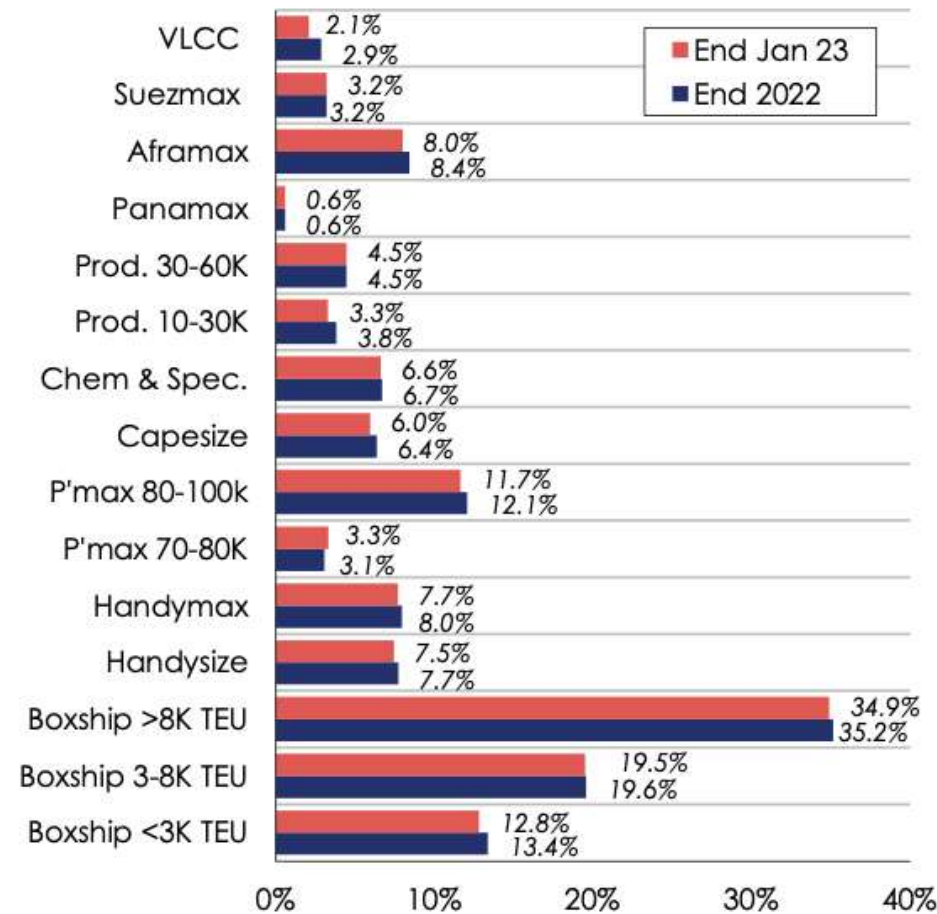


Ship yards Reality of today

- i. Newbuilding Price Index
- ii. Orderbook
- iii. Trend Of Newbuilding Prices
- iv. World Fleet Age Profile
- v. Development of Active Chinese Shipyards

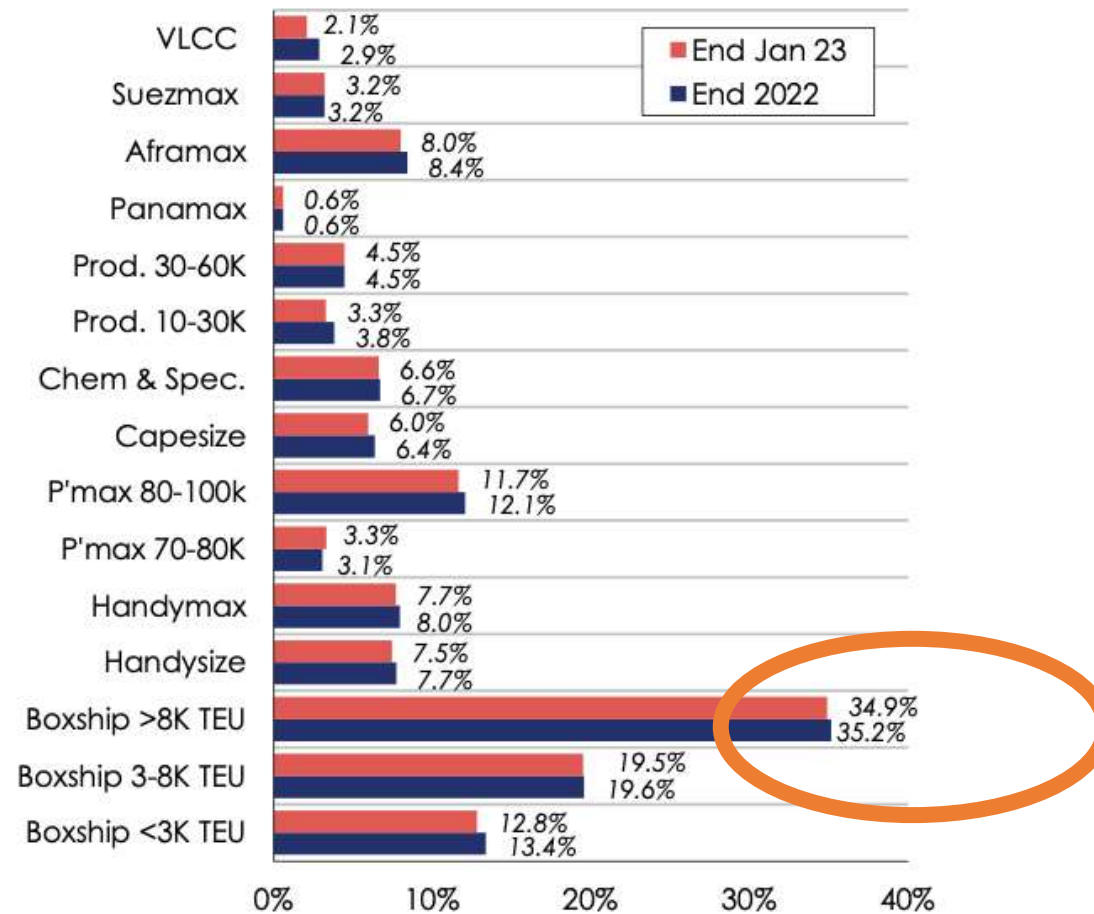
Orderbook by Vessel Type

Orderbook as % of Fleet (dwt)



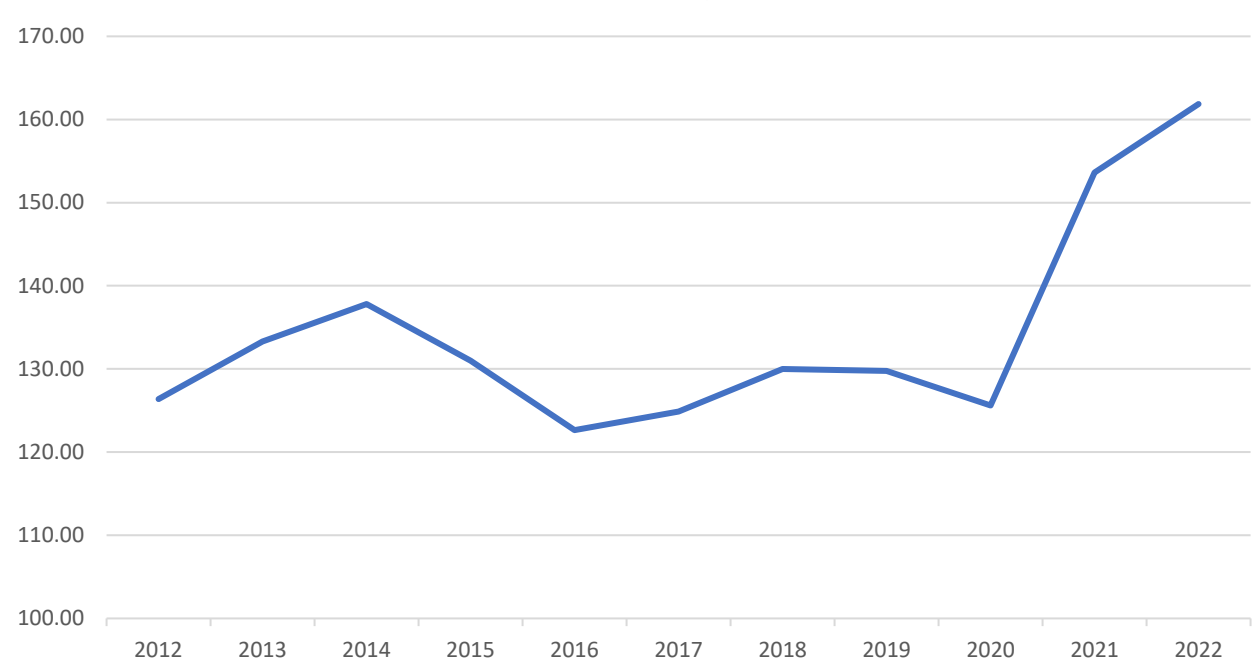
Orderbook by Vessel Type

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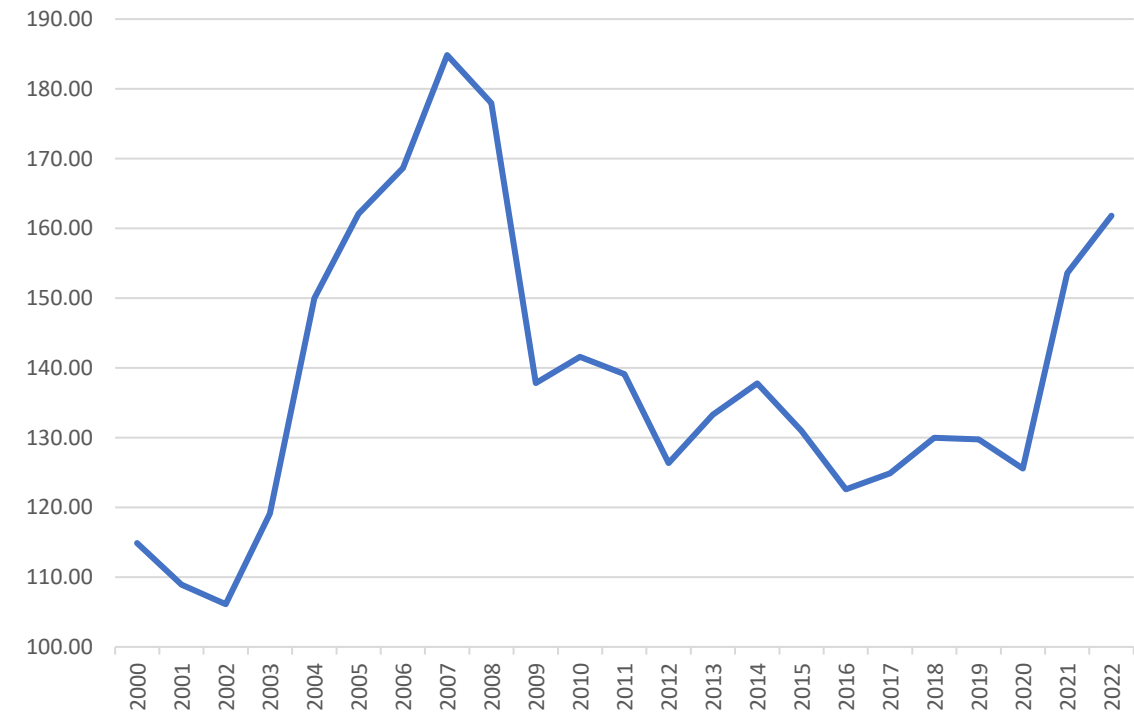


Newbuilding Price Index

10 Year Newbuilding Price Index



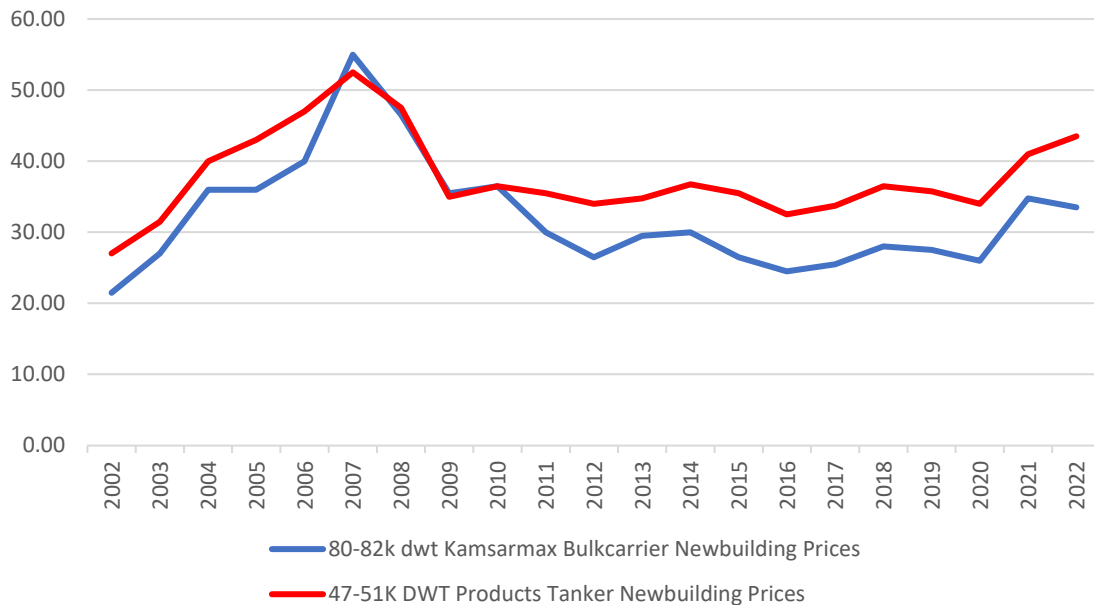
20 Year Newbuilding Price Index



Trend of Newbuilding Prices (indicative assets)

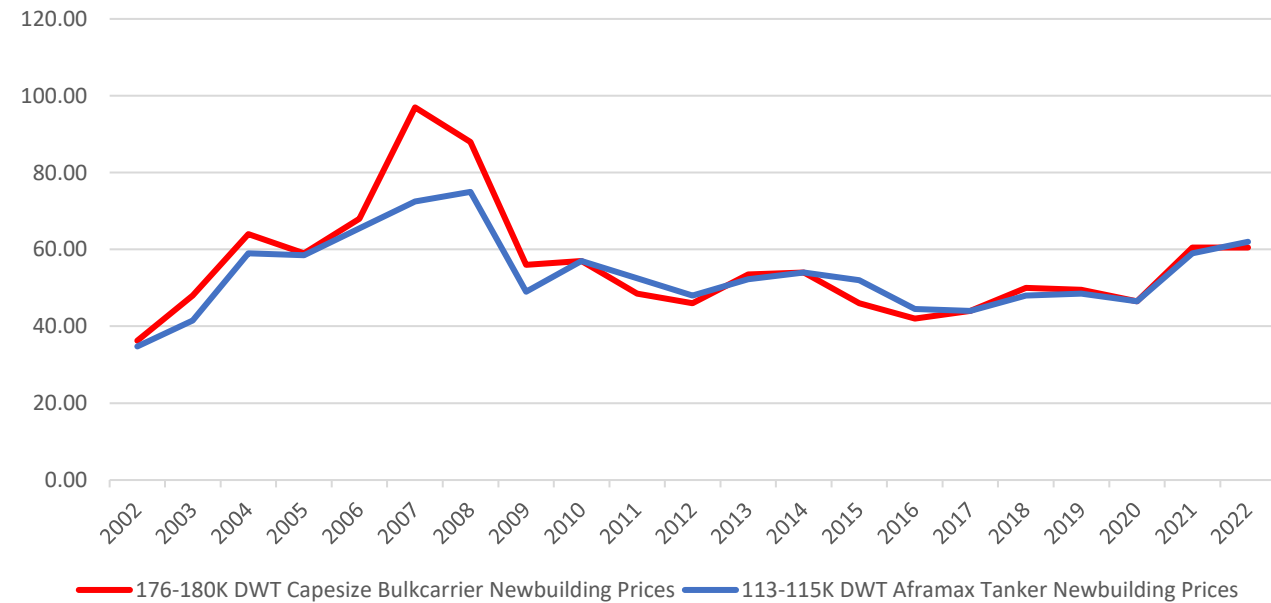
Kamsarmax and MR NB Price (\$ in millions)

2002-2022

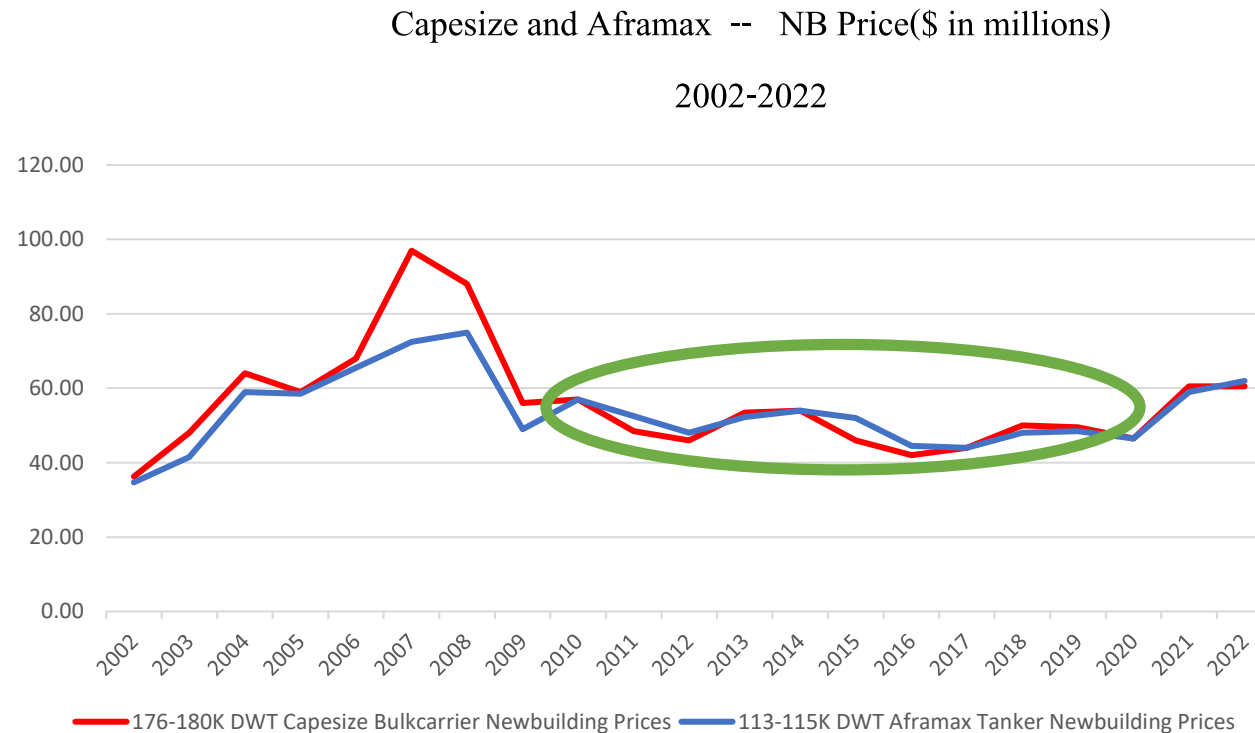


Cape and Aframax NB Price(\$ in millions)

2002-2022

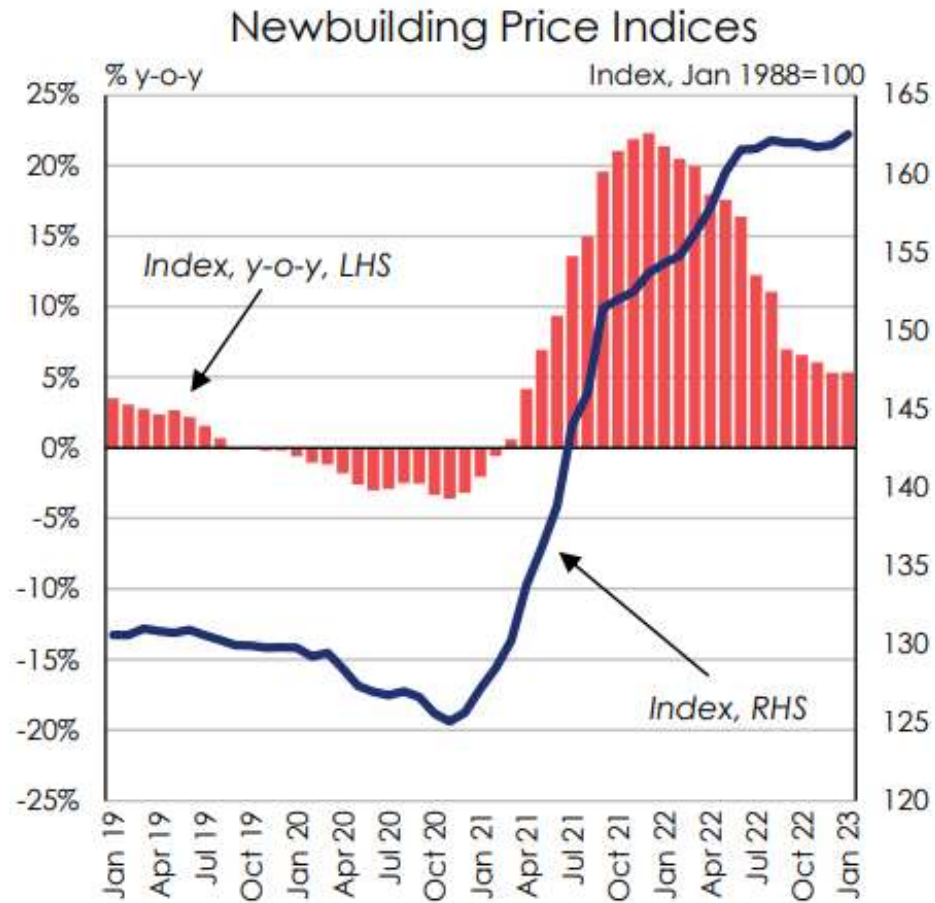


Trend of Newbuilding Prices (indicative assets)



**Ultra low
inflationary
environment**

A New Pricing Reality ?



(Certainly) **Market Driven Forces**
and
(some) **Cost Driven Forces**
causing newbuilding prices to raise

Market Driven Forces

Simple.

Too much Demand , Few Berths.

Market Driven Forces

Why Few Berths:

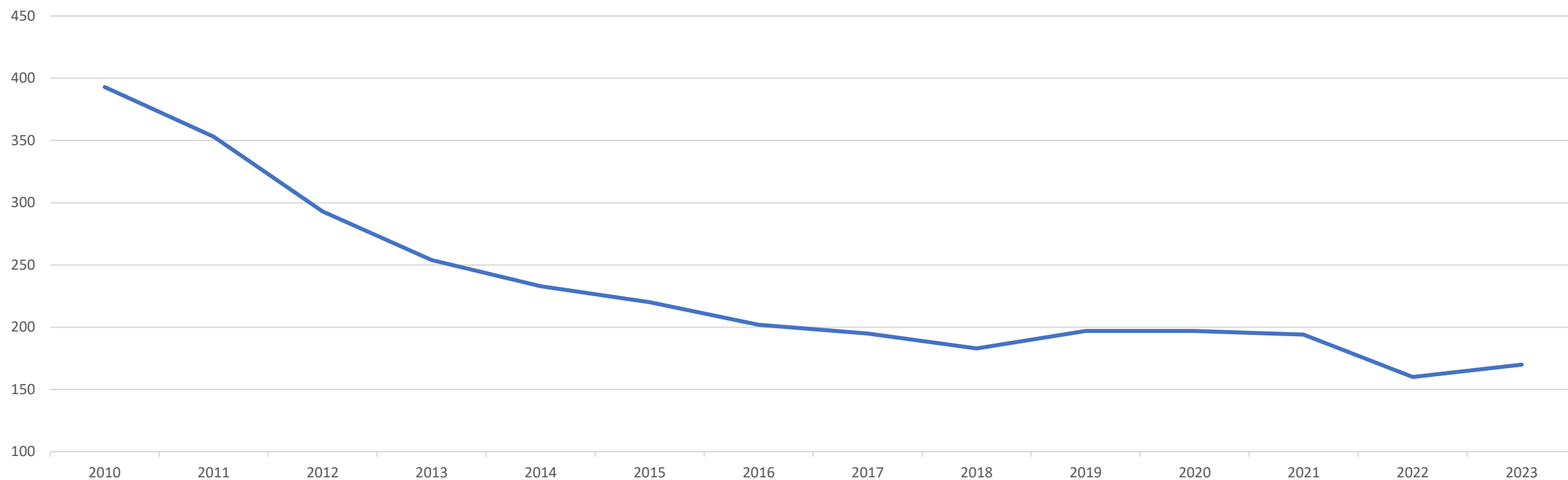
- Reduced Shipyard Capacity
- BOOM of orders in certain ship-types
 - a) Containerships
 - b) LNGCs
 - c) PCTCs
- Market Spikes on ALL Sectors

Containers , Dry , PCTC , LNG, Tankers

Changes in Number of Active Chinese Shipyards

Number of Active Shipyards in China

2010-2023



Cost Driven Forces

- Inflation
- Demand Driven increase of
equipment cost
- Spike of Labour Cost
 - Steel Prices
 - Interest Costs

*what about the strong Dollar ?

How Easy is it ?

To manage the “Energy Transition”
in a high cost environment ?

How Easy is it ?

To manage the “Energy Transition”
in a high cost environment ?

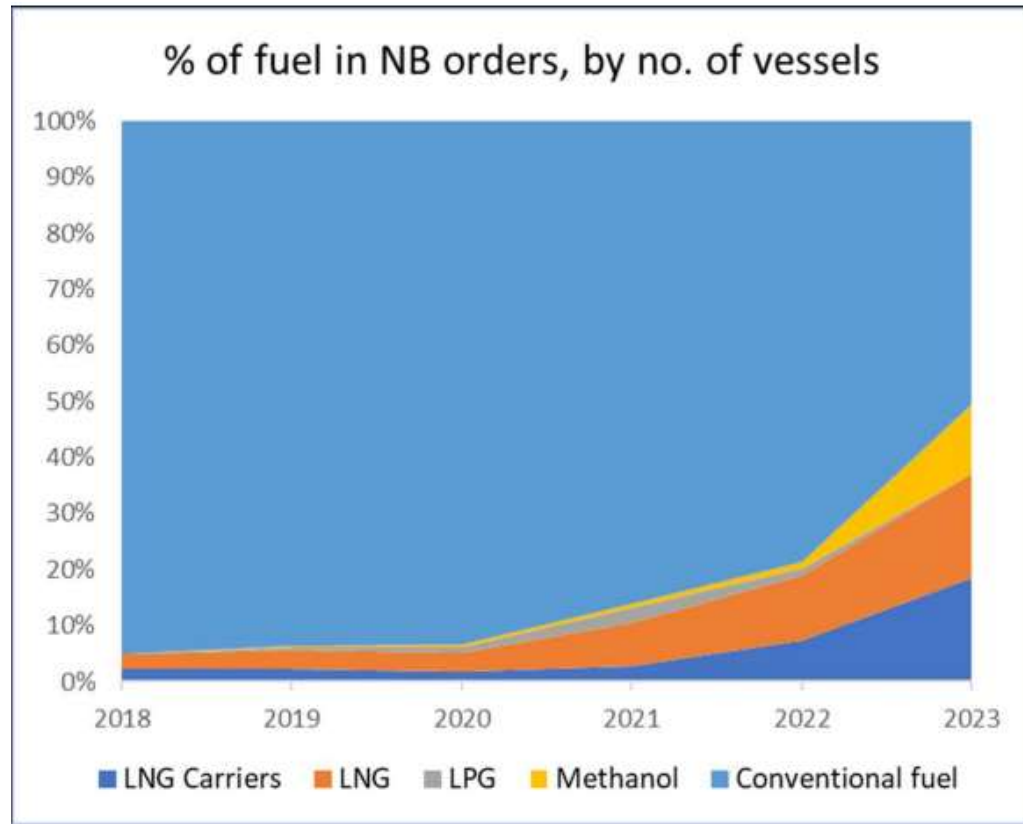
Not easy.

Yet its happening.

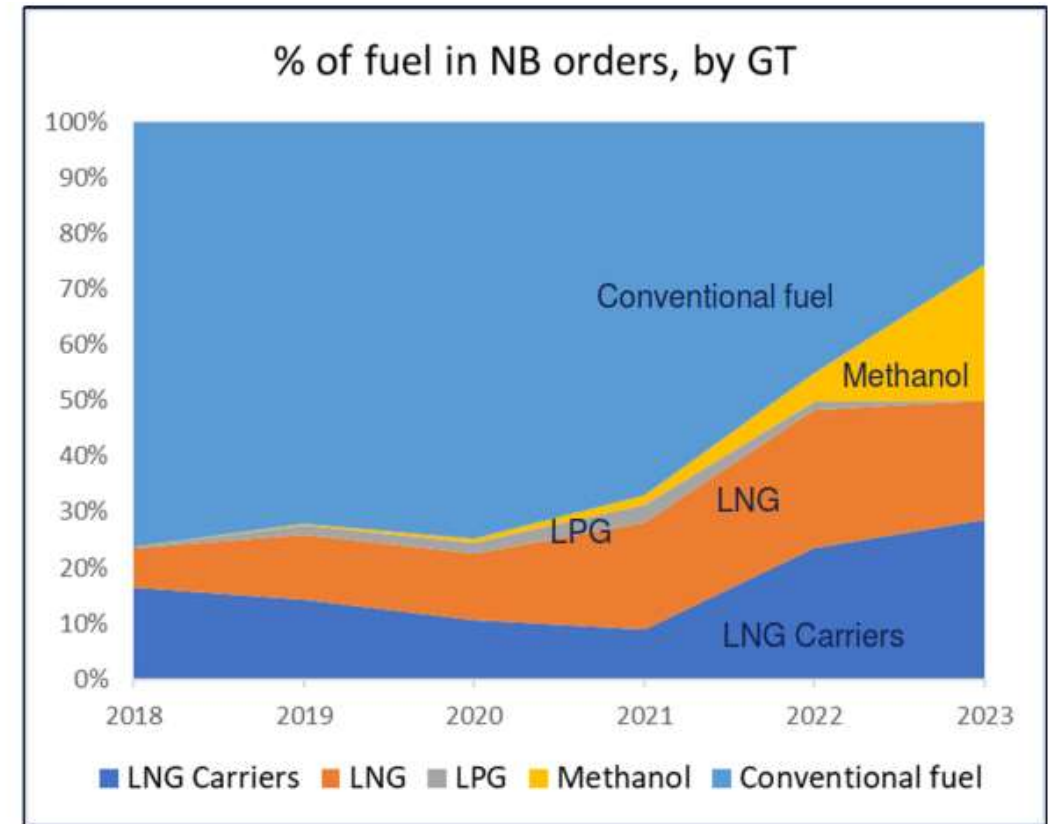
- Majority of newbuilding projects seek “readiness” of fuel transition
- Projects backed by charterers are growing in numbers
- Shipyards working on improving the economics

Newbuilding Orders with Alternative Fuels

No. of Vessels:

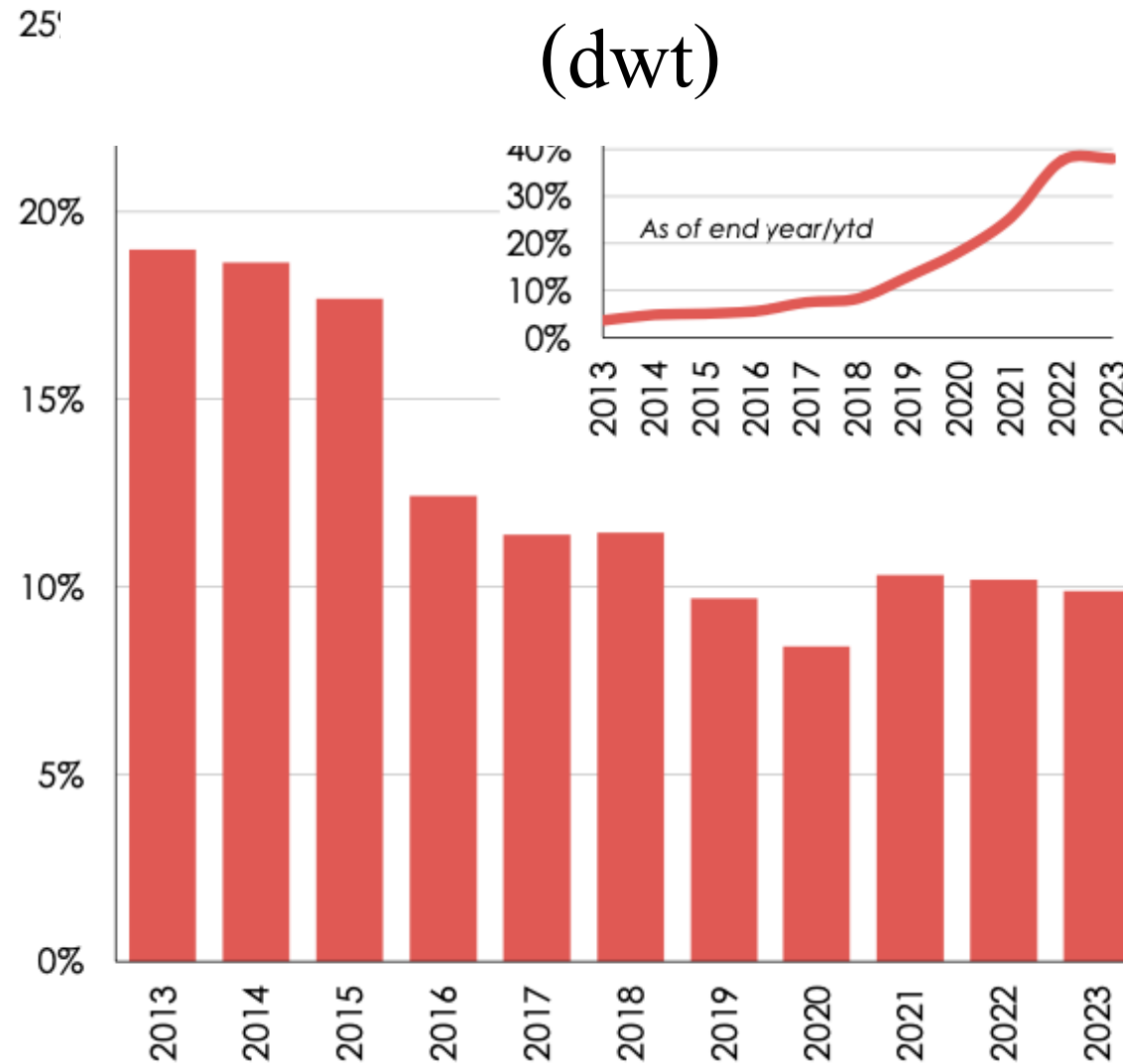


By GT:



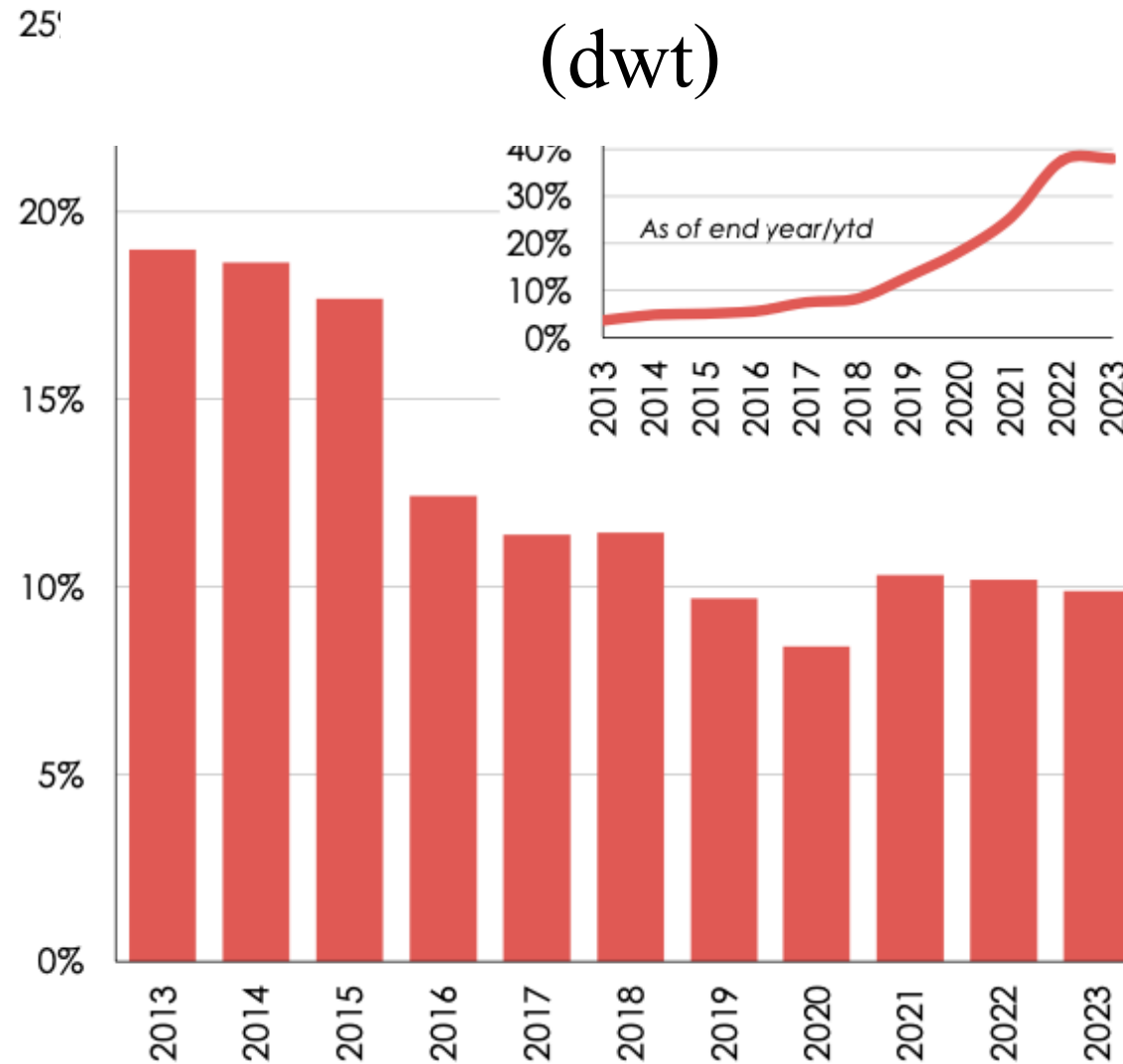
Source: DNV alternative fuels insight

Alternative Fuel as % of Fleet



38% of new
orders based on
NON conventional
fuel bunkering

Alternative Fuel as % of Fleet



38% of new
orders based on
NON conventional
fuel bunkering

*the number a bit based due to big
number of LNG,PCTC, Containers
but we keep it , to end with a

positive note !

THANK YOU

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