

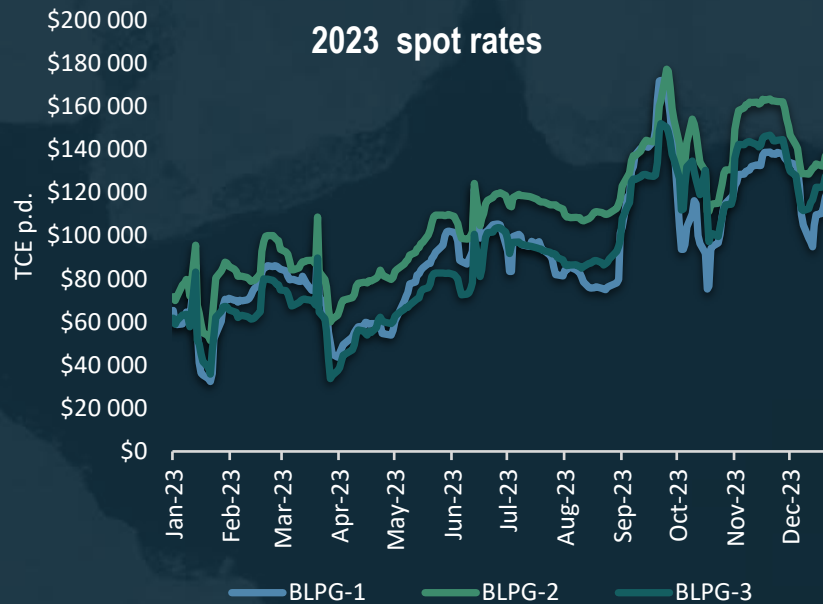
LPG Shipping Perspectives

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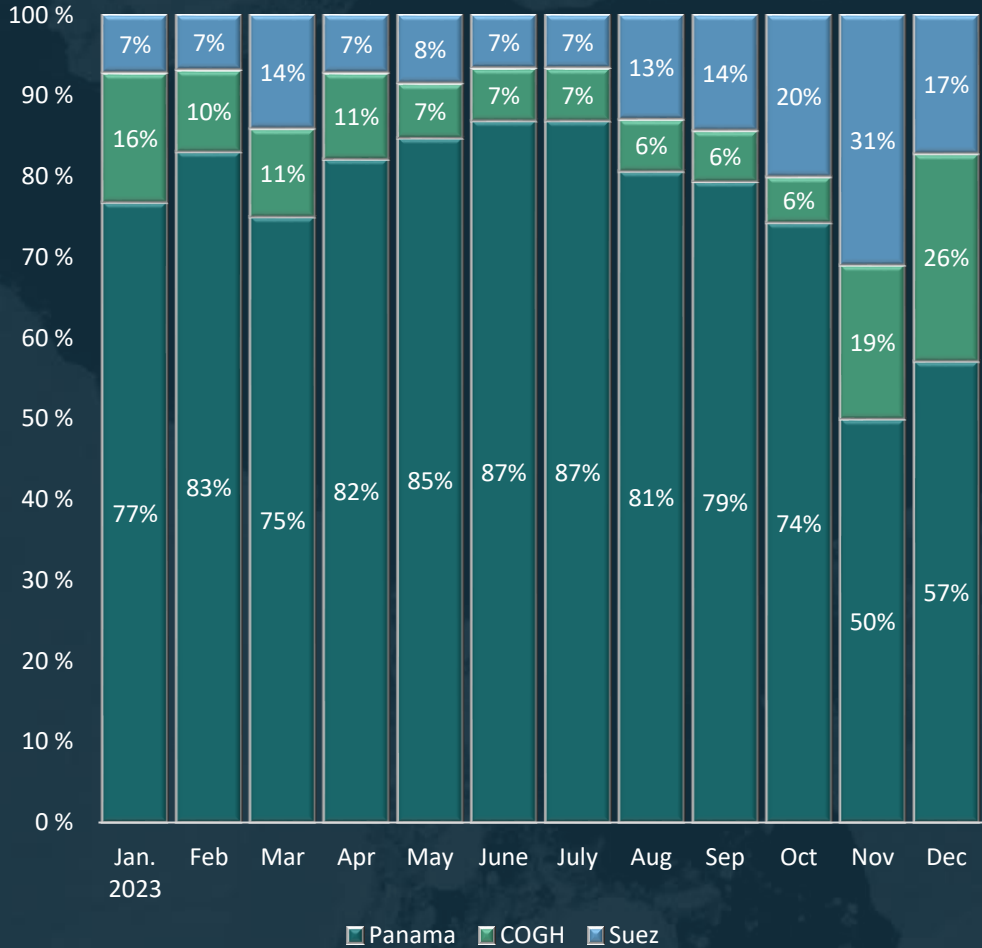
2023 recap



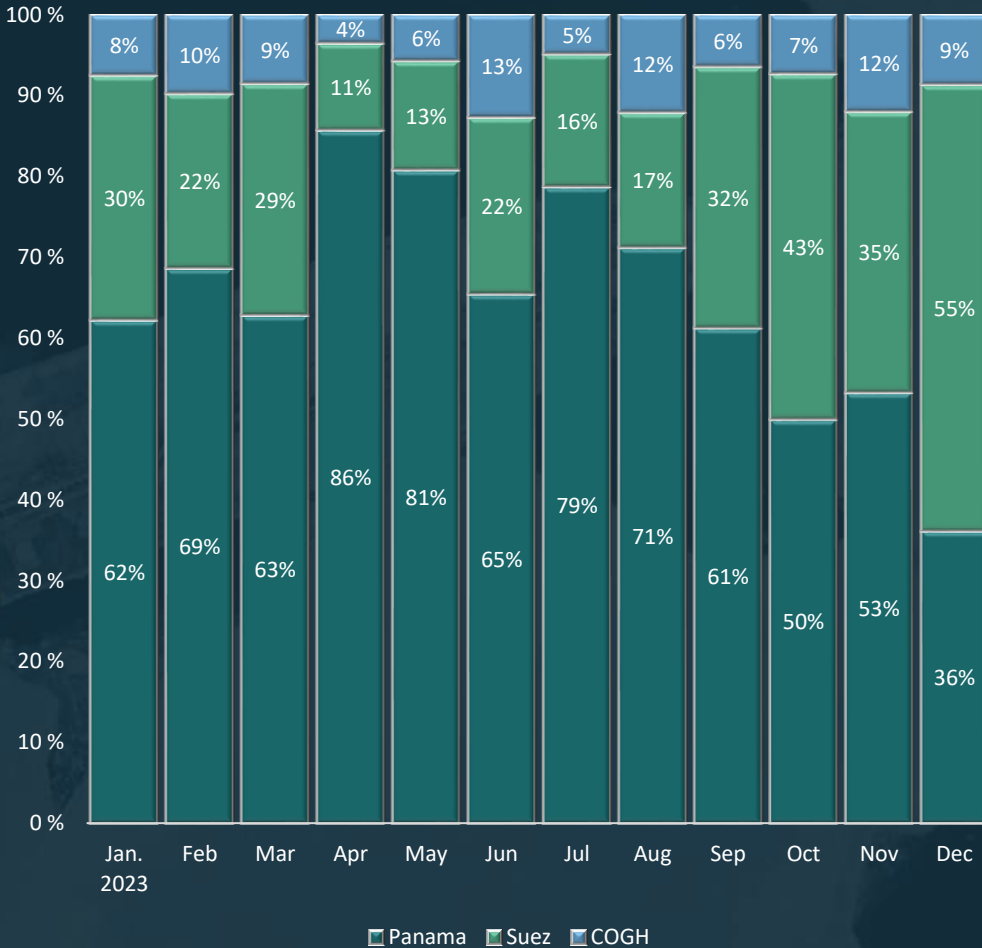
- **Record high earnings:** Across all three routes, spot rates averaged at \$98,600 p.d. in 2023.
- **Delays in newbuilding deliveries:** Out of the 48 scheduled newbuildings, 39 were delivered.
- **High ordering activity:** 35 newbuilding orders placed.
- **6.75% growth in total volumes:** 95 million tonnes lifted on VLGCs.
- **Chinese imports up 20%:** Amid bad operating rates, China imported 5 million incremental tonnes, with a total of 30 million tonnes.
- **Transit restrictions in the Panama Canal:** Due to drought, daily transit capacity lowered by 50% in a down-scaling schedule.
- **Red Sea turmoil:** Strike attacks from Houthi in the Bab al-Mandab Strait causing safety breaches in the Suez Canal.
- **Change in sailing patterns:** Tonne-miles increase by 8.7%, due to forced re-routing, opting for the longer routes.

Change in sailing patterns of U.S. liftings

Laden sailing split, ex USG/USEC going East



Ballast sailing split to USG/USES, ex East

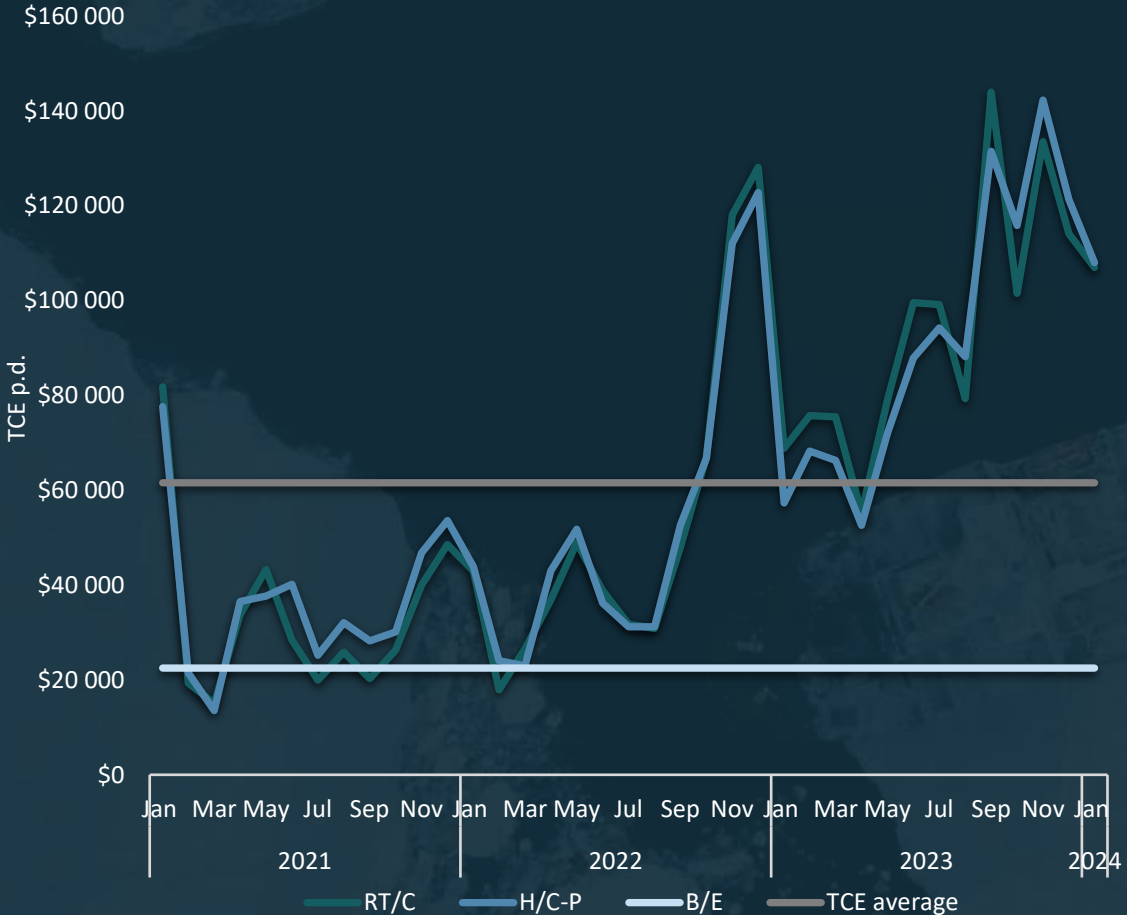


Source: Fearnleys

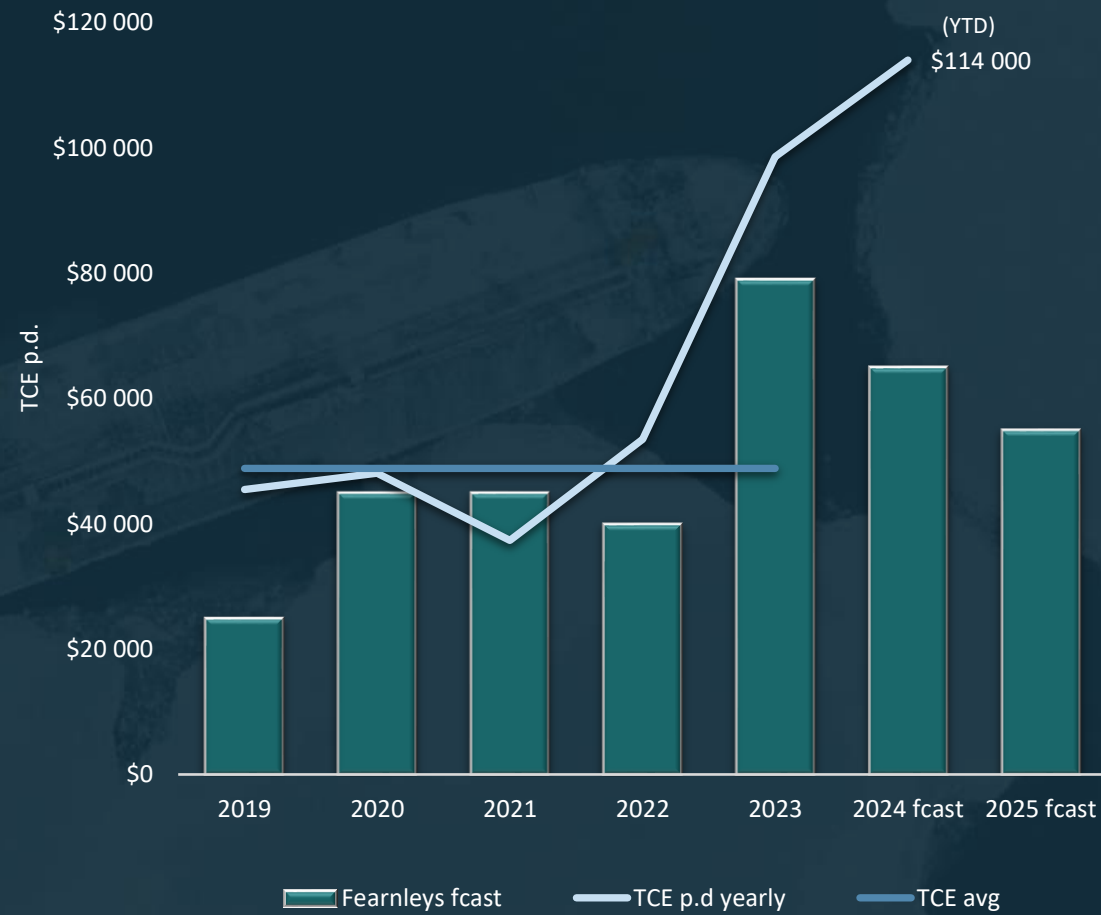
Strong earnings cycle continuing with earnings averaging over double of 4-year B/E

However, earnings remain very volatile

Monthly average spot rates averaging over \$60,000 p.d. since 2021



Strong earnings expected towards 2025

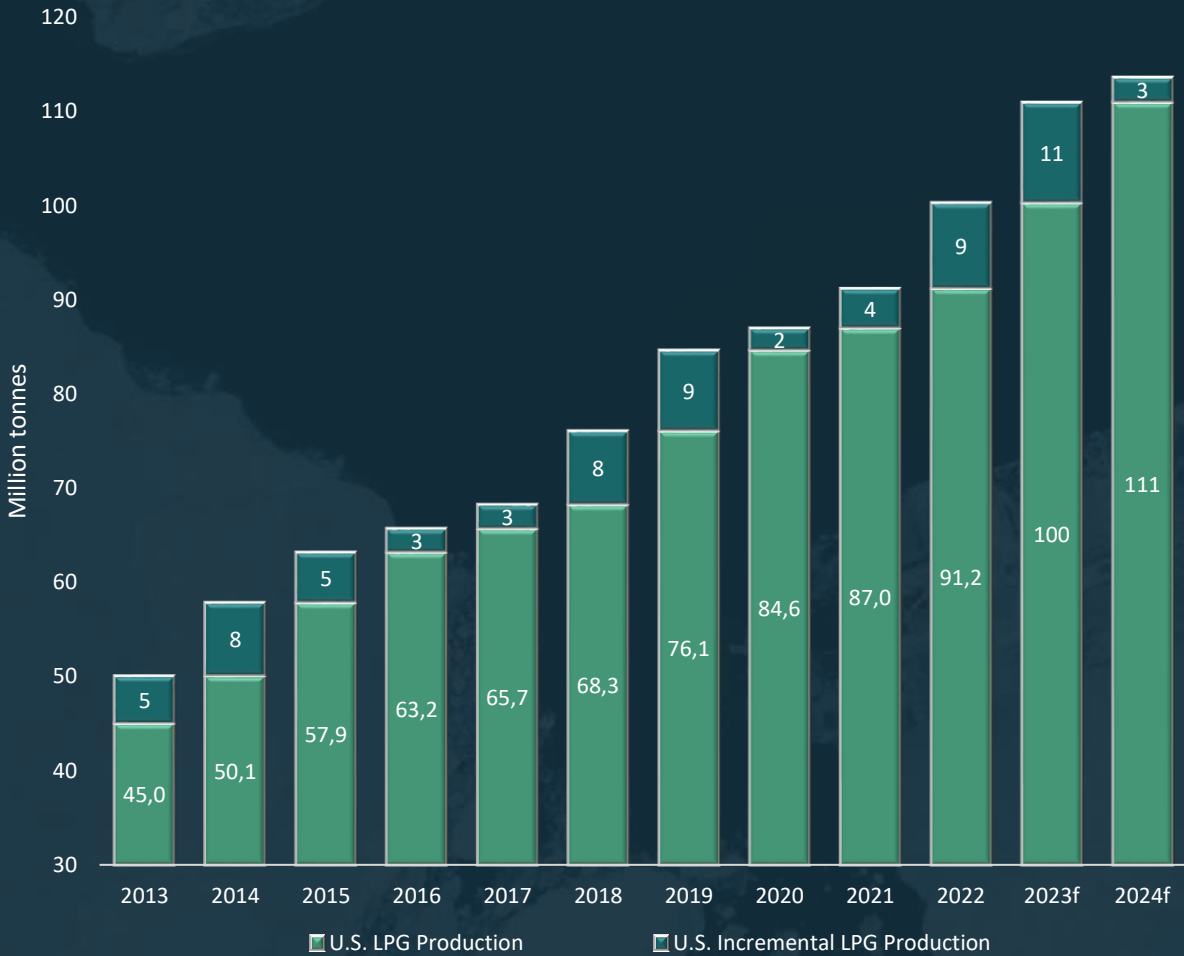


Source: Baltic Exchange, Fearnleys

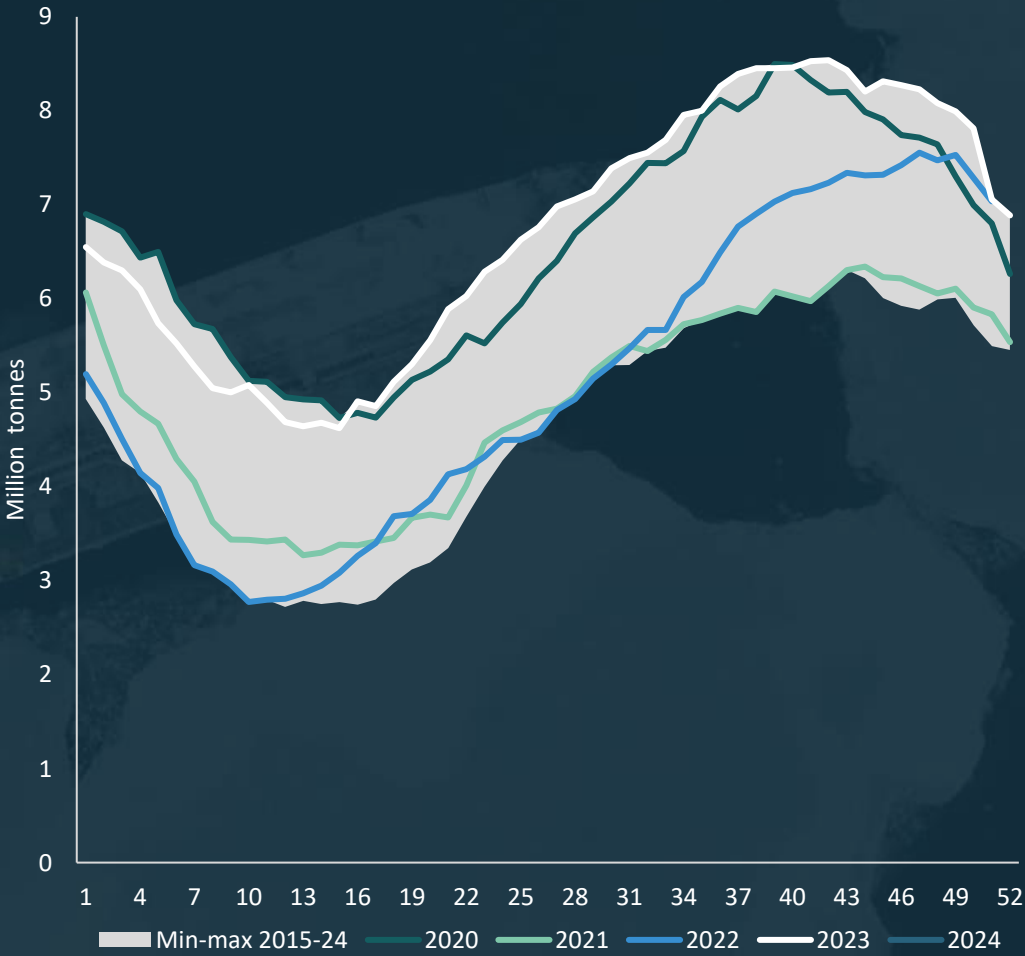
U.S. maintaining market leader-position of production & exports

54% market share, gas-to-oil ratio increased, capacity becoming bottleneck - USG terminal expansions, Houston Ship Channel expansion project, little growth in 2024

CAGR of 5% last 5 years



Record-high U.S. propane stocks

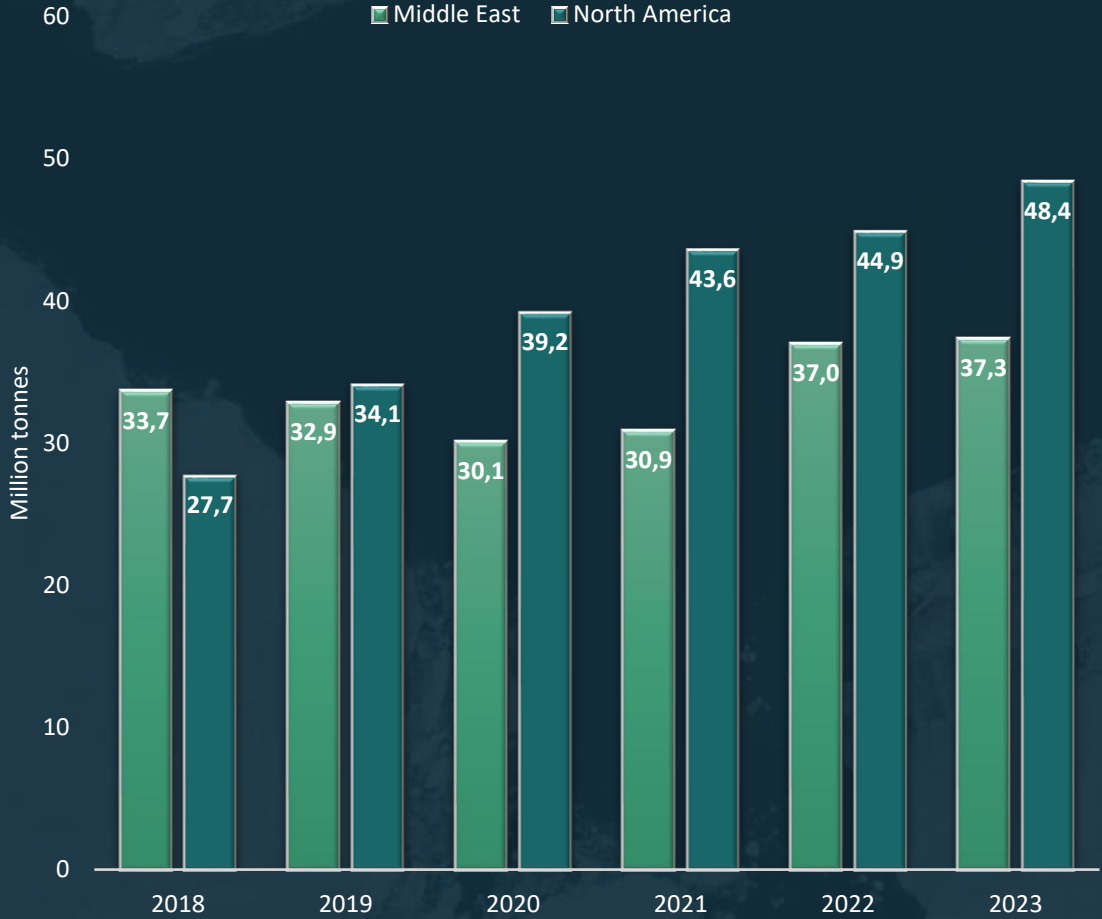


Source: EIA

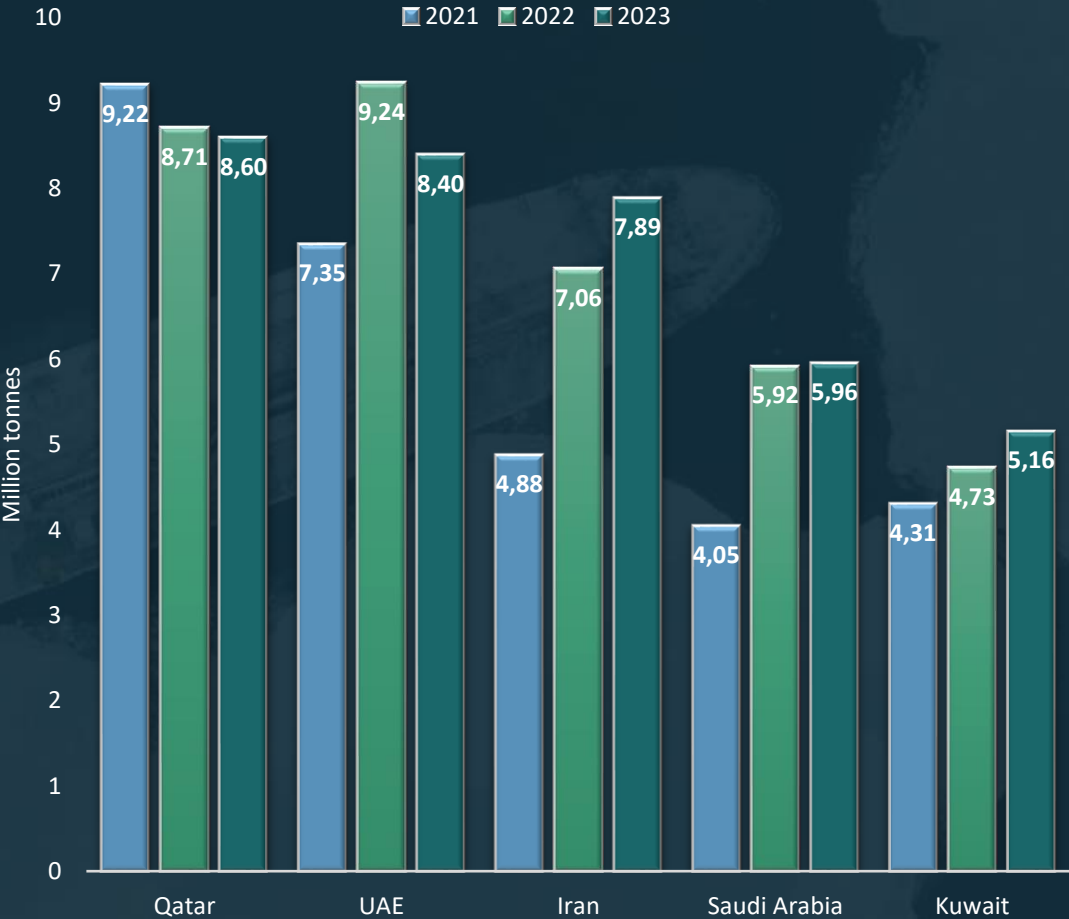
Middle East export growth stagnated

Comeback trend of 2022 not continued in 2023

The two major export hubs



Middle East exports, by country

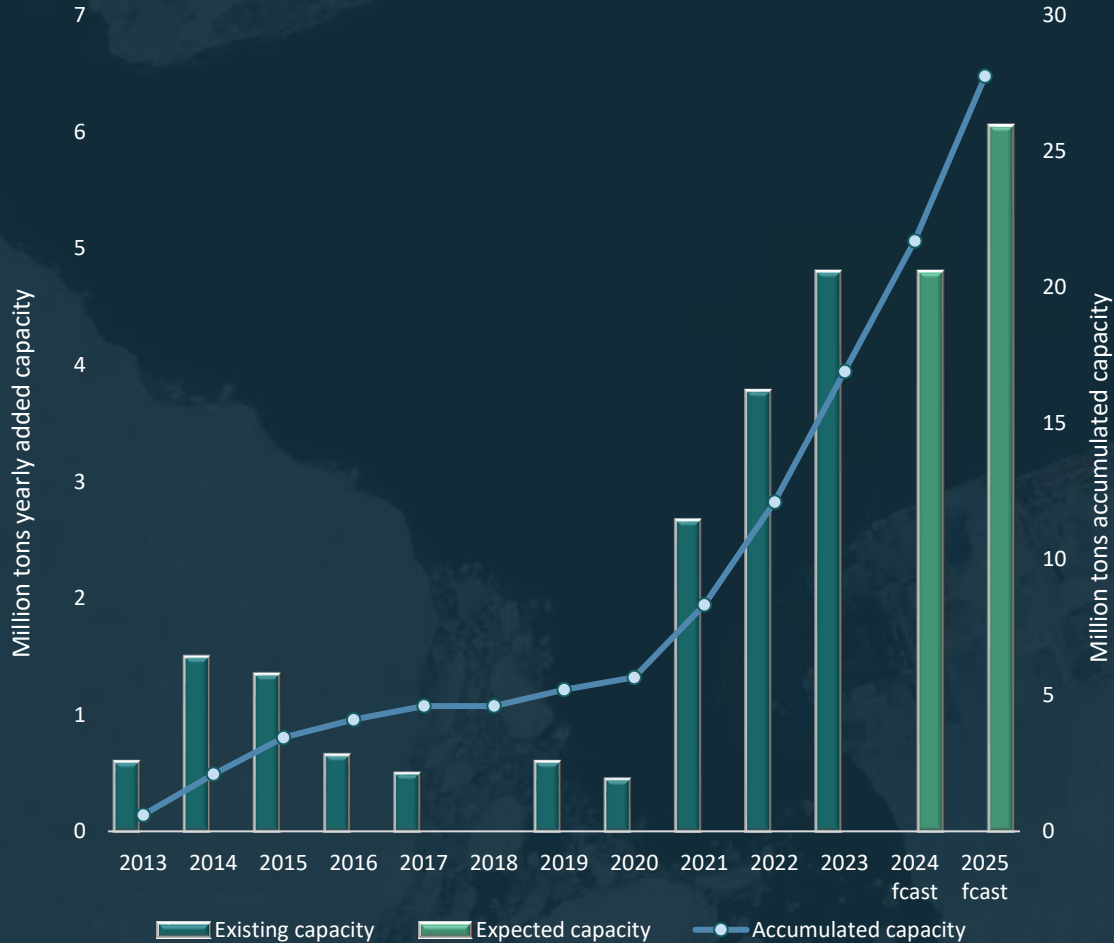


Note: volumes lifted on VLGCs

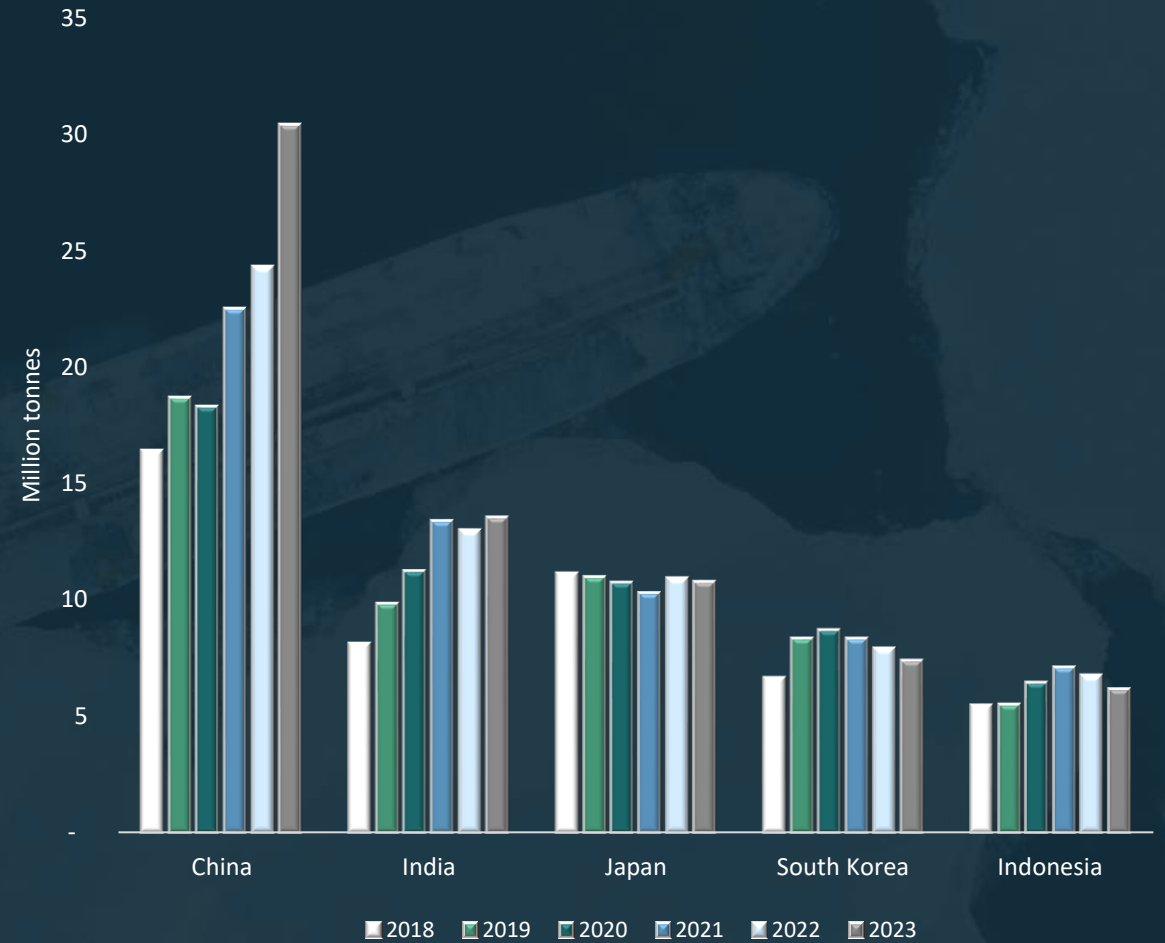
PDH capacity increasing with plant expansions

Chinese PDH plants account for 25-30% of world demand, operating rates at around 70% only in 2023, gloomy outlook on demand growth, benchmark 30 million tonnes p.a.

China PDH capacity demand



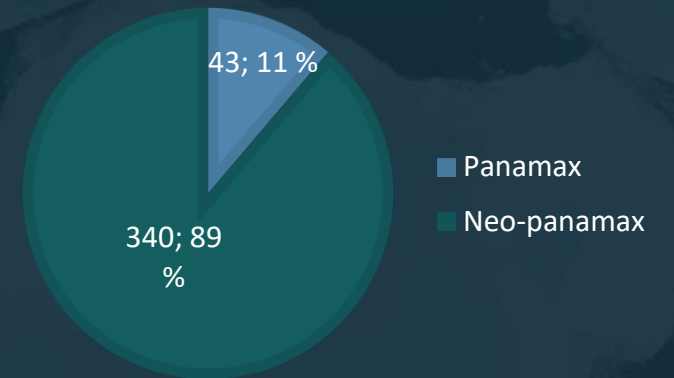
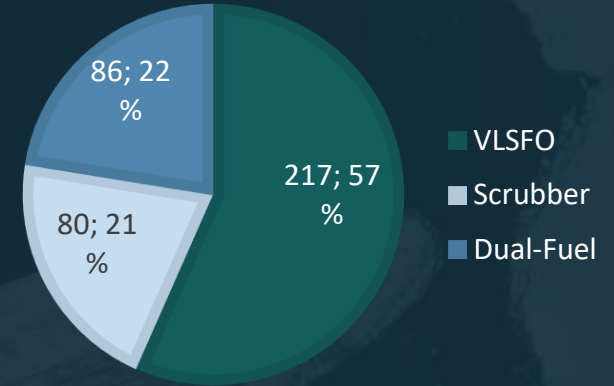
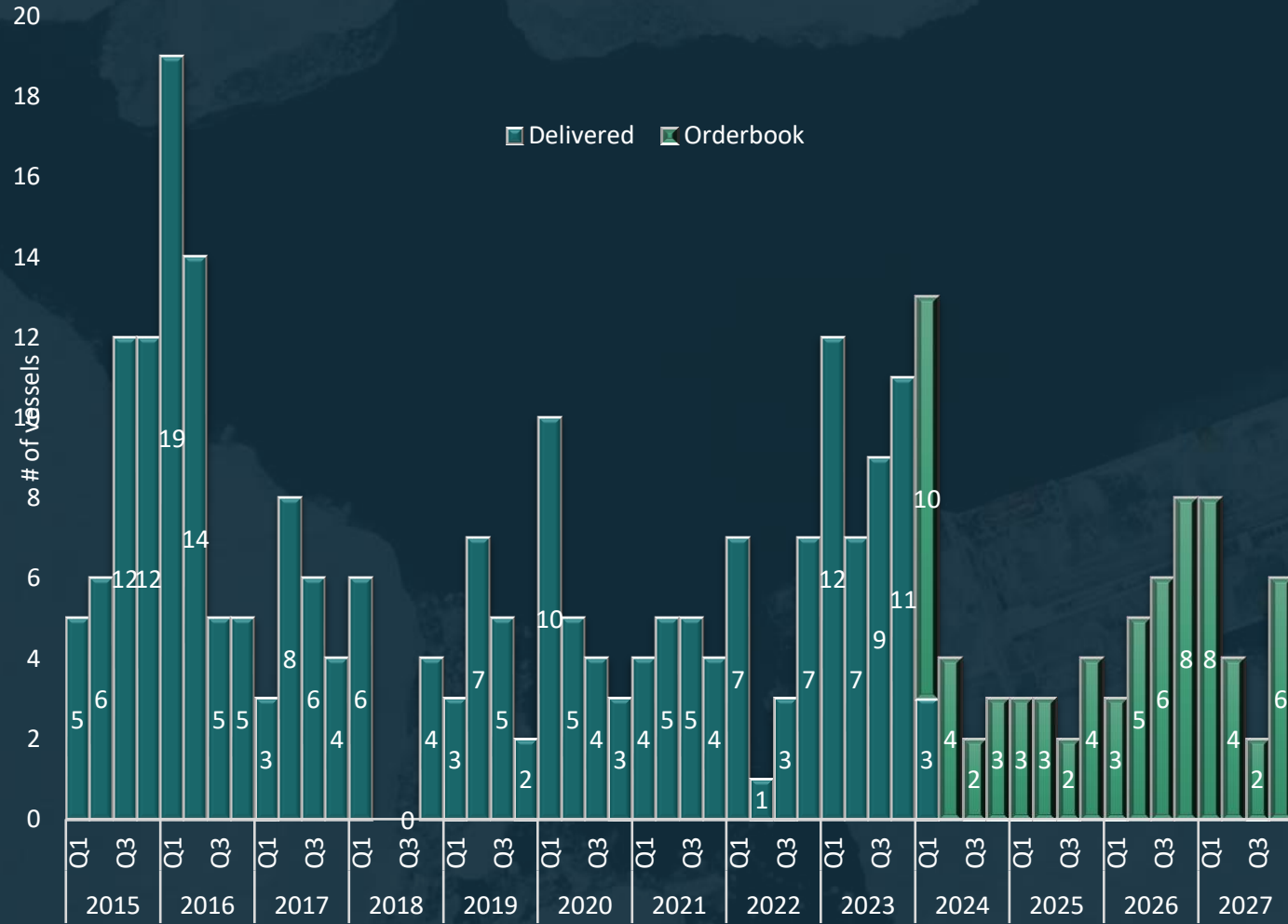
Far East imports



Note: volumes lifted on VLGCs

Fleet development

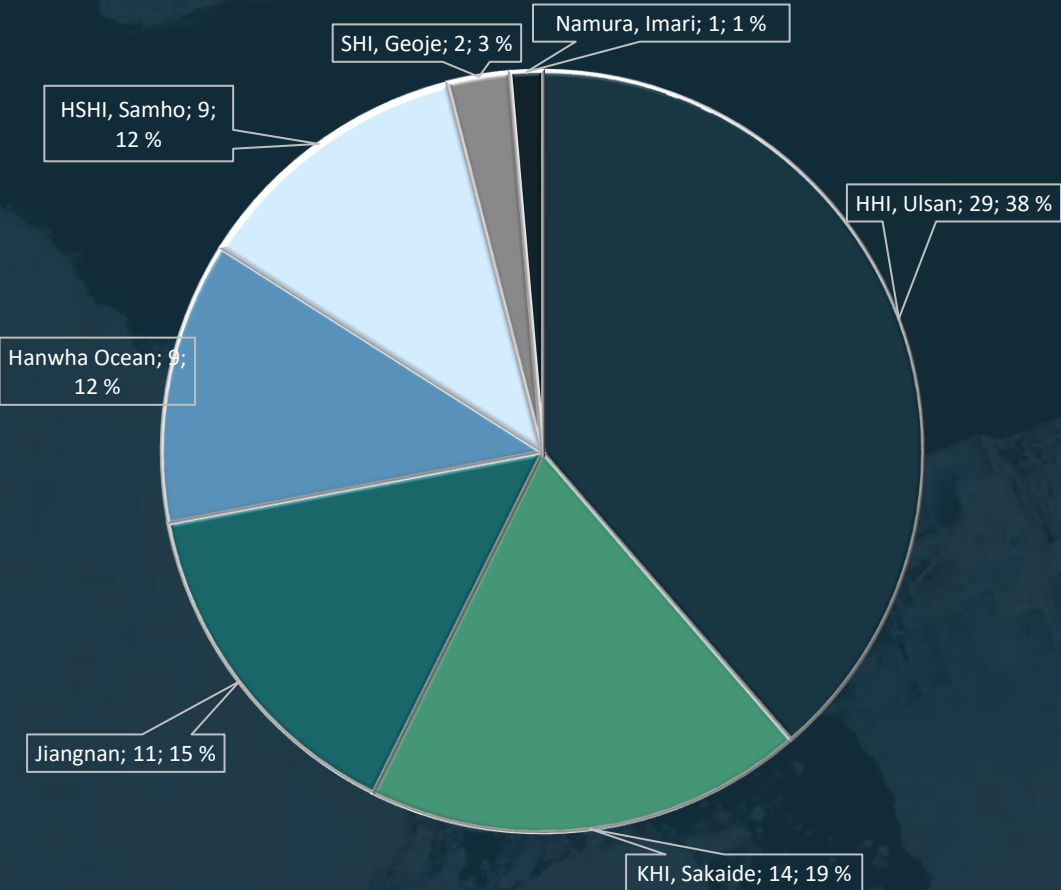
383 vessels, average age 9.85 yrs (9% older than 25 yrs)



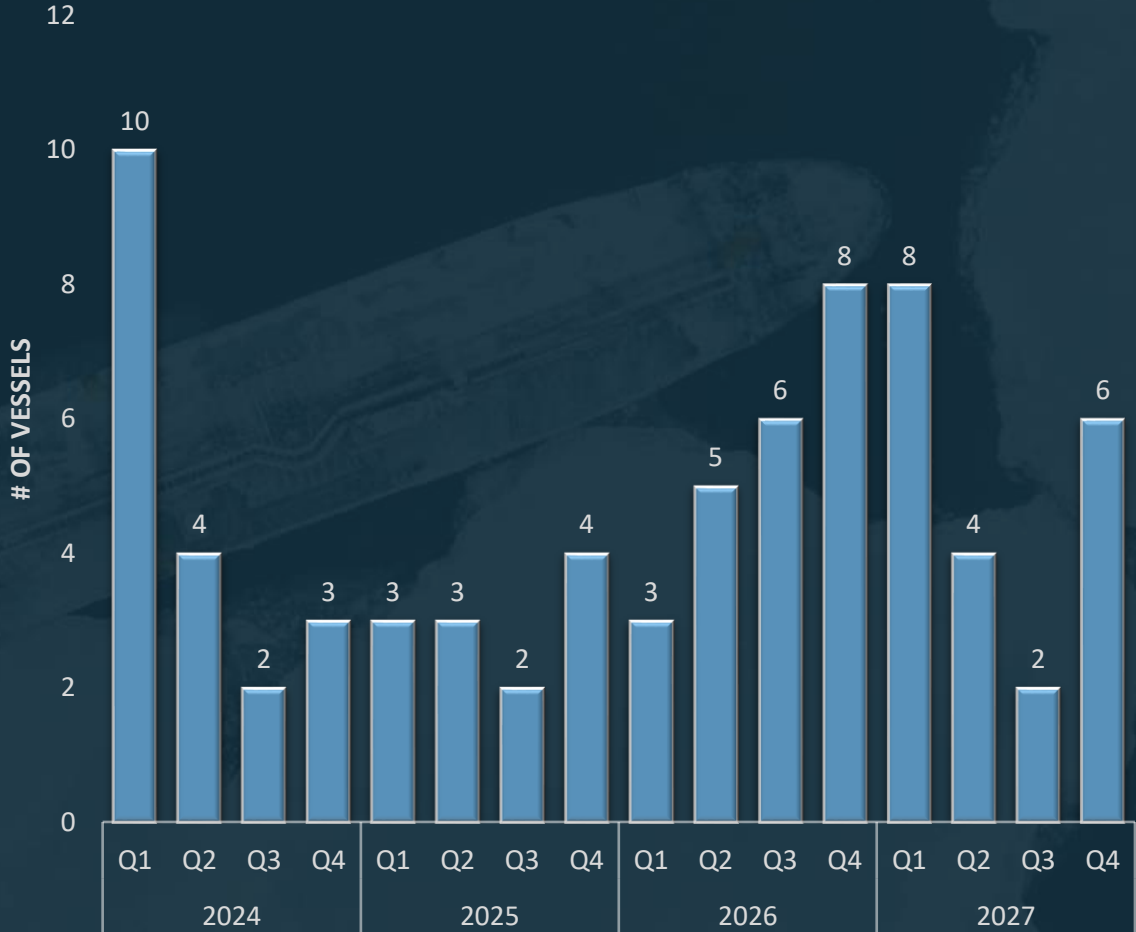
Orderbook

OB-fleet ratio of 19% with 73 vessels, 36 of type Panamax, 46 “ammonia capable”

Orderbook by yard



Orderbook delivery schedule



Source: IHS, Fearnleys

VLAC = VLGC + NH₃

- **Ammonia-capability**

Requirements for ammonia as part of *Cargo Certificate*:

- Reinforcement of the feet of the tanks
- More nickel in the steel
 - Additional cost of \$1.5-2.0 million cost

- **Ammonia-ready engines**

- Conversion from LPG as the other dual fuel, to ammonia: cost of \$2.5million *if* piping & tanks are ready
- Ammonia as marine fuel is not 100% ready
- Engines delivered to yard at the end of 2024
- Ready for delivery on vessels in Q1/Q2 2025
- Challenges: toxicity, regulations, low energy-density, price

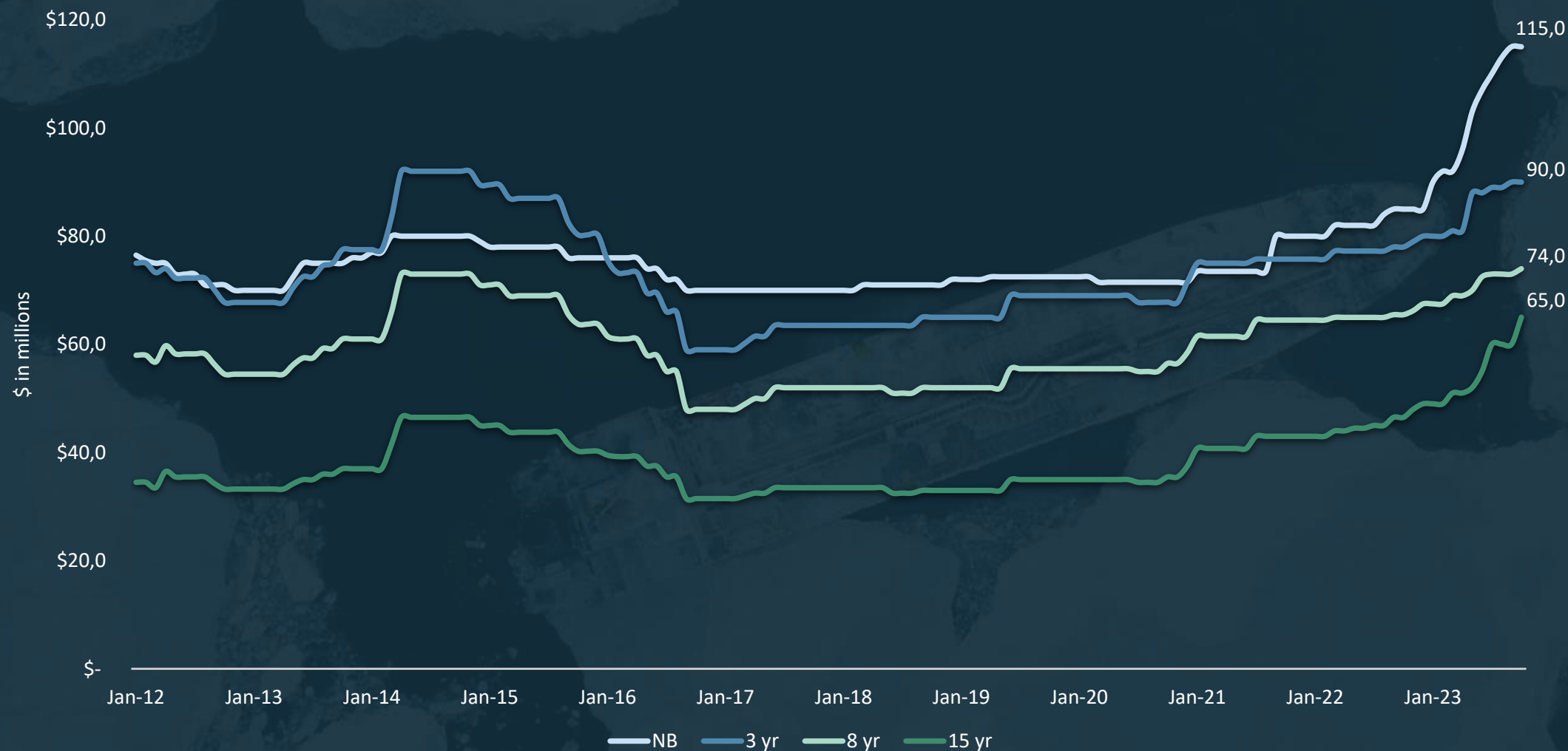
- *Dedicated trade*: 21 days to change cargo from propane-ammonia, vice versa.

- Production and export of ammonia set to grow exponentially in the long term – enabling a demand for large-scale seaborne ammonia transportation.



Asset values

“Ammonia-capable & ammonia-ready” price tag of about \$120-125 million.

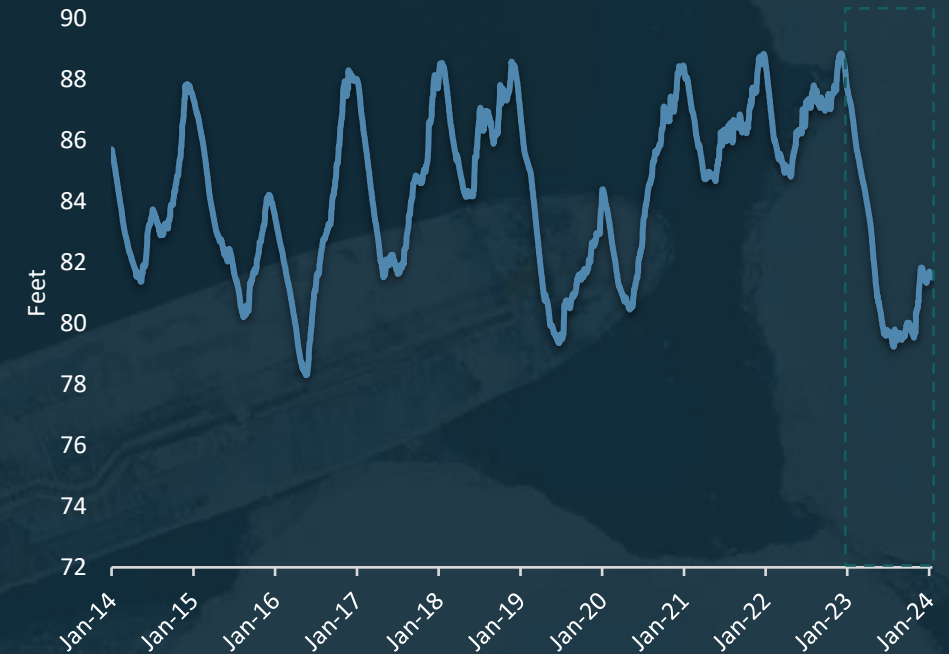


The Panama Canal ~ a problem without a solution

Average daily transits for VLGCs through the canal is 3 in laden, 2 in ballast

- **Building pressure since the opening of new locks in 2016**
 - Vast orderbook of LNG & Containerships coming. U.S. set to be the biggest exporter of LNG in years to come.
 - Newbuildings now ordered as Panamax.
- **Drought in Gatun Lake**
 - Resulting in draft limitations for passing vessels.
 - Imposed transit capacity restrictions in November. Total capacity to be halved by February 2024.
 - Restrictions predicted to last throughout 1H '24, (until further notice).

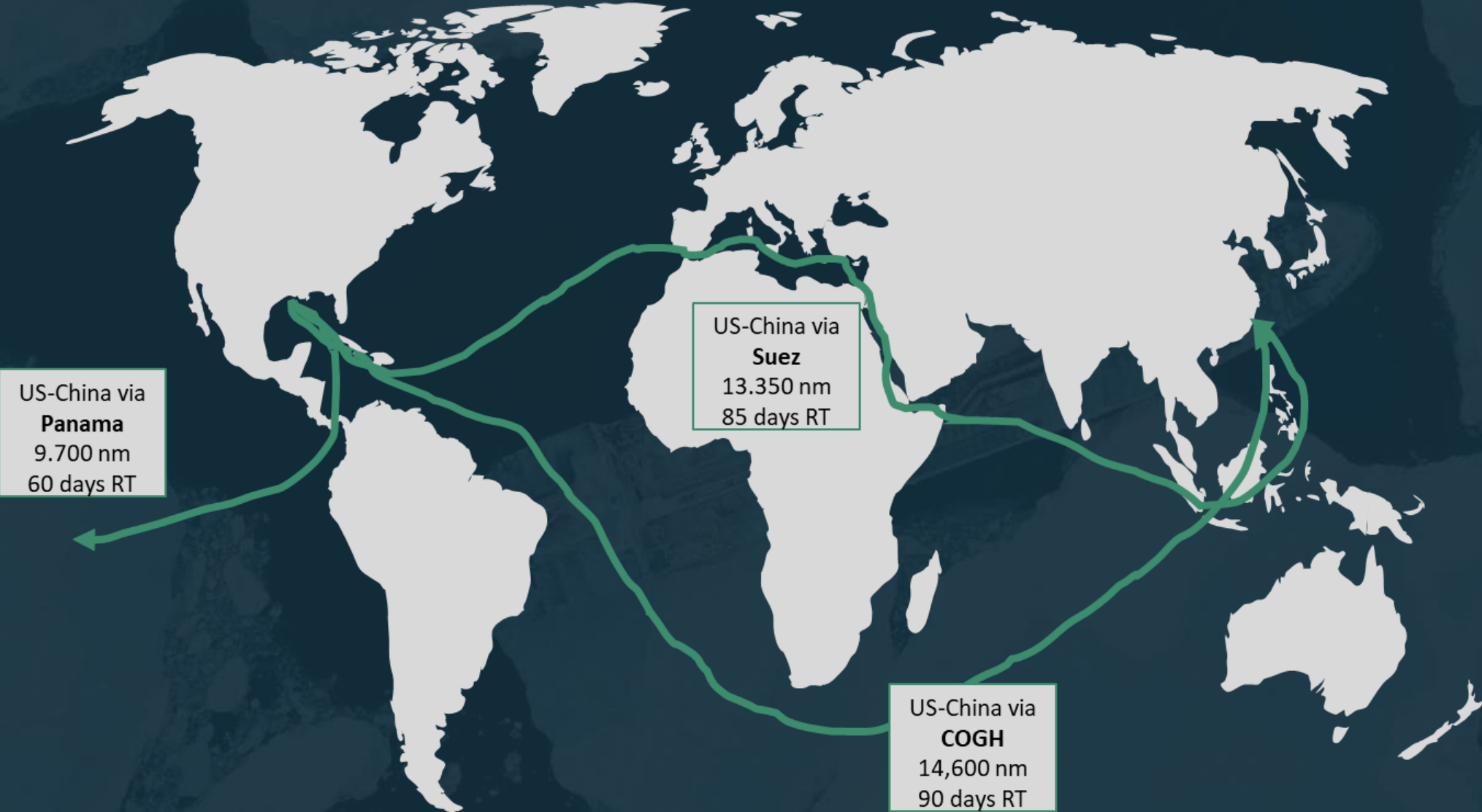
Waterlevels in Gatun Lake



	Neo-panamax	Panamax
November	8	17
December	8	16
January	7	15
February	7	13

Forced re-routing around COGH or through the Suez Canal

Suez/COGH ~ 50% increase in tonne-miles & voyage durations









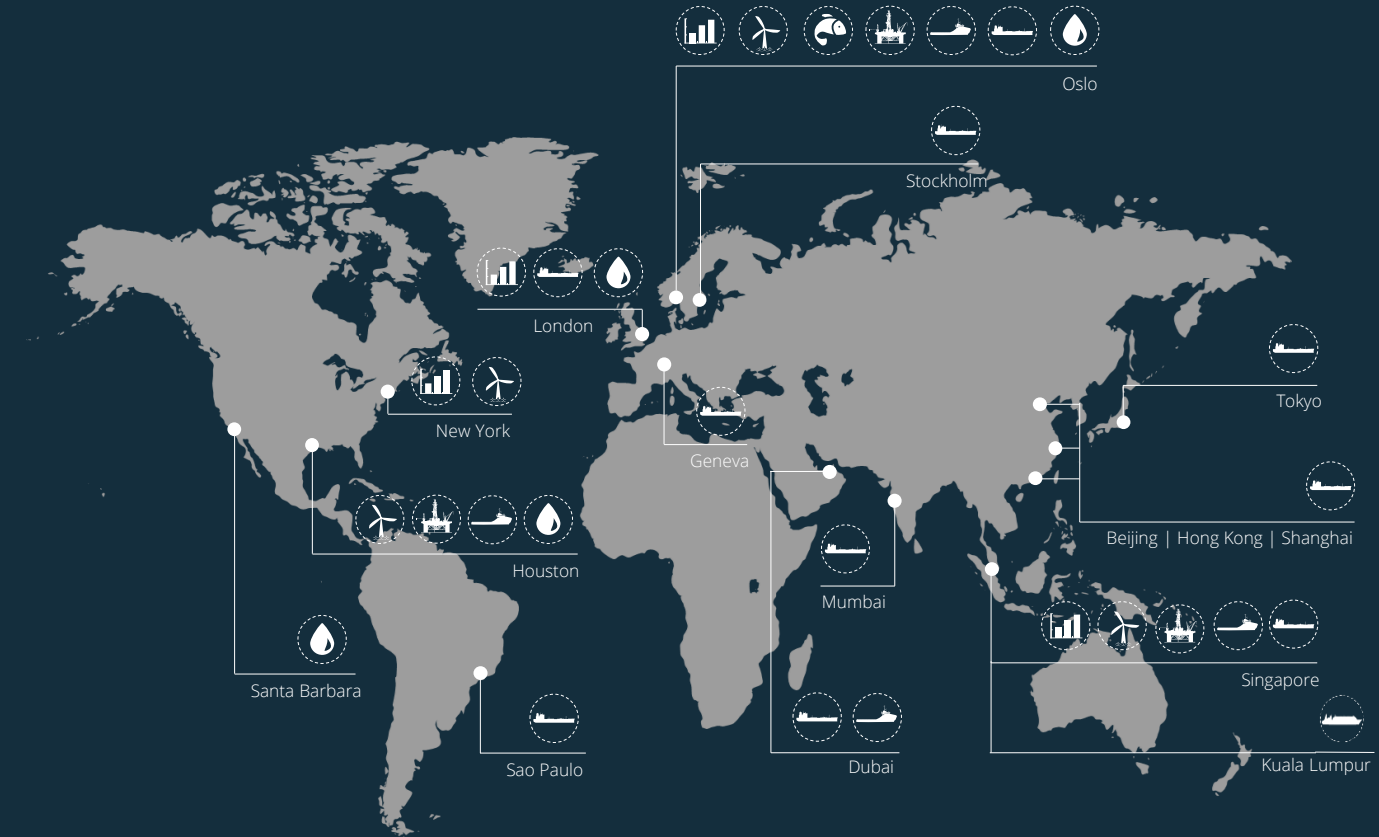
Shipping looking tight, amid uncertain market conditions...

- Fleet expansion of about 20 vessels per year throughout 2027
- Assumed low growth in China, however, India expected to increase their import demand due to governmental subsidy scheme
- Continuation of increased tonne-miles due to longer voyages. Uncertainties in voyages patterns remain
- Despite anticipation of low prices in the West, East demand and price levels will determine the width of the arbitrage, again affecting the level of freight

Astrup Fearnley

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-  Aquaculture
-  Shipping
-  Offshore Rig
-  Offshore Supply
-  Energy Broking



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The Astrup Fearnley Global Network

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