



GIIGNL knowledge sharing session

How bio-LNG can be set up in European
Terminals?

The Role of Bunkering

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Andrea Qualiano

Head of Green Gas Origination and Gas Supply Portfolio Decarbonization

WHY BIOLNG IS THE MOST EFFECTIVE SOLUTION

LNG benefits as a fuel

- LNG reduces NOx emissions by up to 80% and almost eliminates SOx, particulate matter (PM)
- LNG as a fuel enables the design of ships with a reduction of around 20% of their Energy Efficiency Design Index rating than the conventional ones, and whose Carbon Intensity Indicator is expected to be decrease of the same amount.
- Technology is largely mature, but the recent progress in modern engine technology my enhance the GHG emissions reduction by up to ~20%.
- The ongoing developments in conventional LNG supply infrastructures are fostering LNG abundance and affordability.

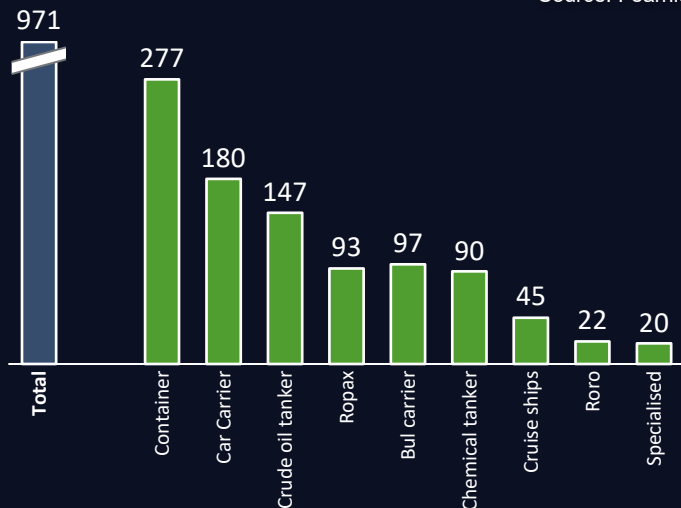
BioLNG bolster the GHG reduction

- Whilst LNG is deemed to be a transition fuel to strongly support the reduction of GHG energy intensity of vessels, it shall be blended with **BioLNG** to enhance its ability to further hammer down the carbon emissions of the maritime sector.
- Indeed, as the GHG emissions are calculated in a **well-to-wake perspective** according to FuelEU Regulation (2023/1805), **BioLNG can contribute to squeeze emission of up to about 90%.**
- Thus, **BioLNG blending** will be key to achieve the emission targets.
- Ultimately, the total cost of ownership of a vessel fueled with BioLNG is comparable with LNG, thus making BioLNG a competitive solution in the long run.

A PRAGMATIC AND COST-EFFECTIVE APPROACH IS NEEDED TO MEET EU TARGETS
THE LNG FUELLED FLEET IS SET TO GROW GLOBALLY, BY EXPANDING THE TARGETABLE DEMAND FOR
BIOLNG

Global LNG Fuelled Ships in operation

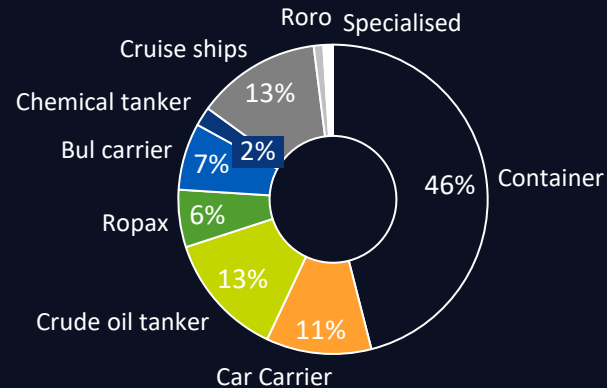
Source: Fearnleys



- Almost a thousand of vessels are currently fuelled with LNG, mostly used for containerships and car carriers

Order Book of LNG Fuelled Ships

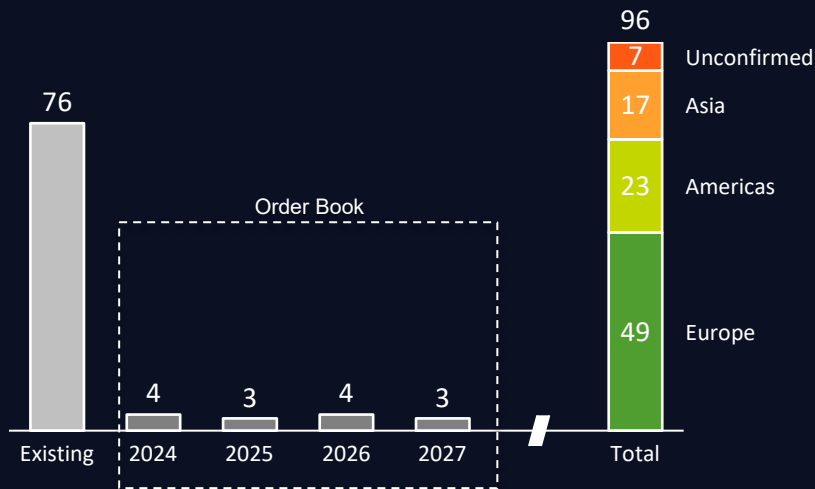
Source: Fearnleys



- The order book is mostly driven by Containerships
- So far, LNG vessels were accounting for a third of new orders with alternative fuels, on the expectation that other fuels would have been more viable than LNG.
- However, such alternative fuels are apparently facing major concerns about costs and large-scale availability, thereby prompting LNG back on the shipowners radar

LNG Bunker Vessels in operation and ordered

Source: Fearnleys



- So far a total of 76 SSLNG vessels and bunkers are operating globally.
- Around 65% of these vessels are operating primarily for bunkering purposes, whilst 25% are serving as SSLNG carriers (i.e., transporting LNG to terminals) and the remaining 10% can operate in both ways.

Set the pathway to BioLNG in the Maritime Sector

- **Sustainable fuels** are key to meet the GHG emission targets set by FuelEU Regulation 2023/1805.
- Although some alternative fuels were initially expected to gain more attention from the industry, cost concerns and time-to-market **are prompting LNG to be deemed as the most cost-effectiveness solution.**
- Thus, the more LNG vessels are ordered the more chances there are for **BioLNG to contribute to decarbonize** the shipping industry.
- In fact, BioLNG can be delivered in the form of **physical molecules** or “**virtually**” whereby biomethane is injected into the gas network and virtually transported to LNG terminals using the existing infrastructure through a system of **mass balancing and guarantees of origin.**
- However, some operating and regulatory issues are still preventing BioLNG to consistently support the maritime industry to reduce its GHG energy intensity:
 - › **Operating:** how to preserve the chain of custody along the value chain
 - › **Infrastructural:** LNG Coastal Deposits to be enlisted as key assets for LNG bunkering.
 - › **Regulatory:** lack of harmonization of rules among MS on PoS transfer.

LNG COASTAL DEPOSITS MAY SUPPORT THE DELIVERY OF BIO-LNG VIA SSLNG FACILITIES

THE CASE OF EDISON

The Ravenna Coastal Deposit



The first LNG Bunkering in the Adriatic Sea



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A SOLID EXPERTISE IN THE WHOLE VALUE CHAIN...



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