

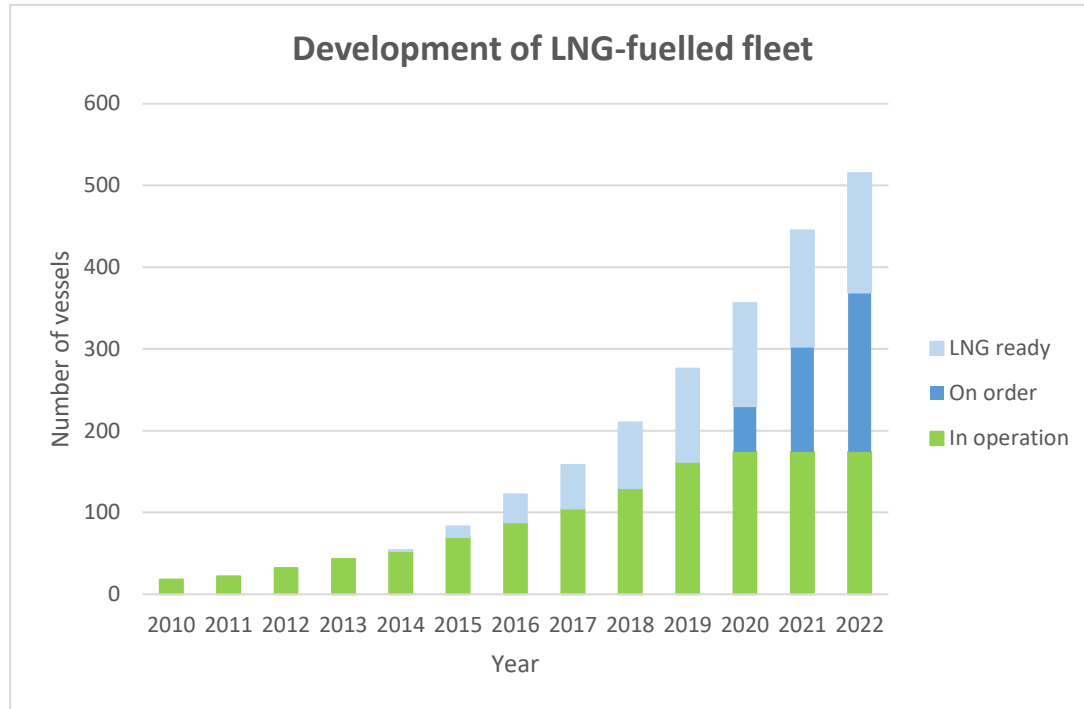
# SEA-LNG

LNG as a marine fuel – a solution now;  
a solution for the future

Madrid LNG & Shipping Forum – 12<sup>th</sup> November, 2020



# Uptake of LNG as a marine fuel is accelerating



Source DNV-GL AFI

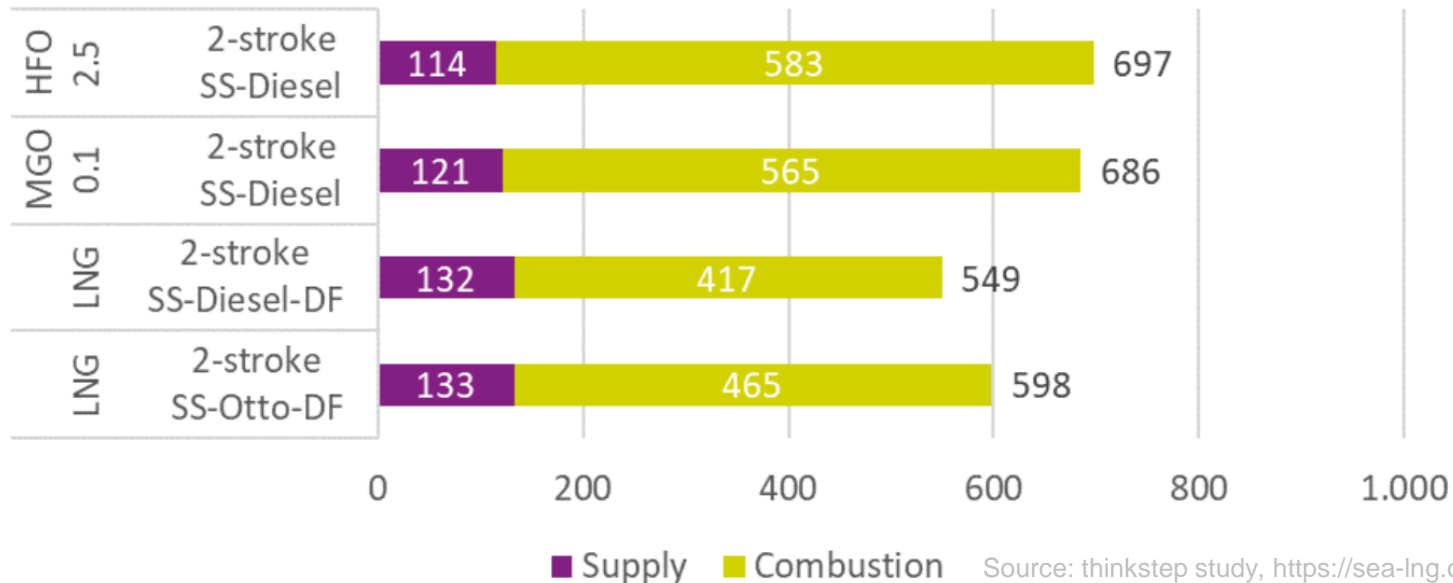
- Number of LNG-fuelled vessels has grown by 20%-40% per annum
- Represent 13% of the current new build order book (16% if LNG-ready vessels included)
- For some segments - such as the ultra-large container vessels - more than 50% of the order book are either LNG-fuelled or LNG ready
- Supply side growing in parallel - LNG bunkering available in 118 ports and under development in 90





# LNG – a superior emissions performance

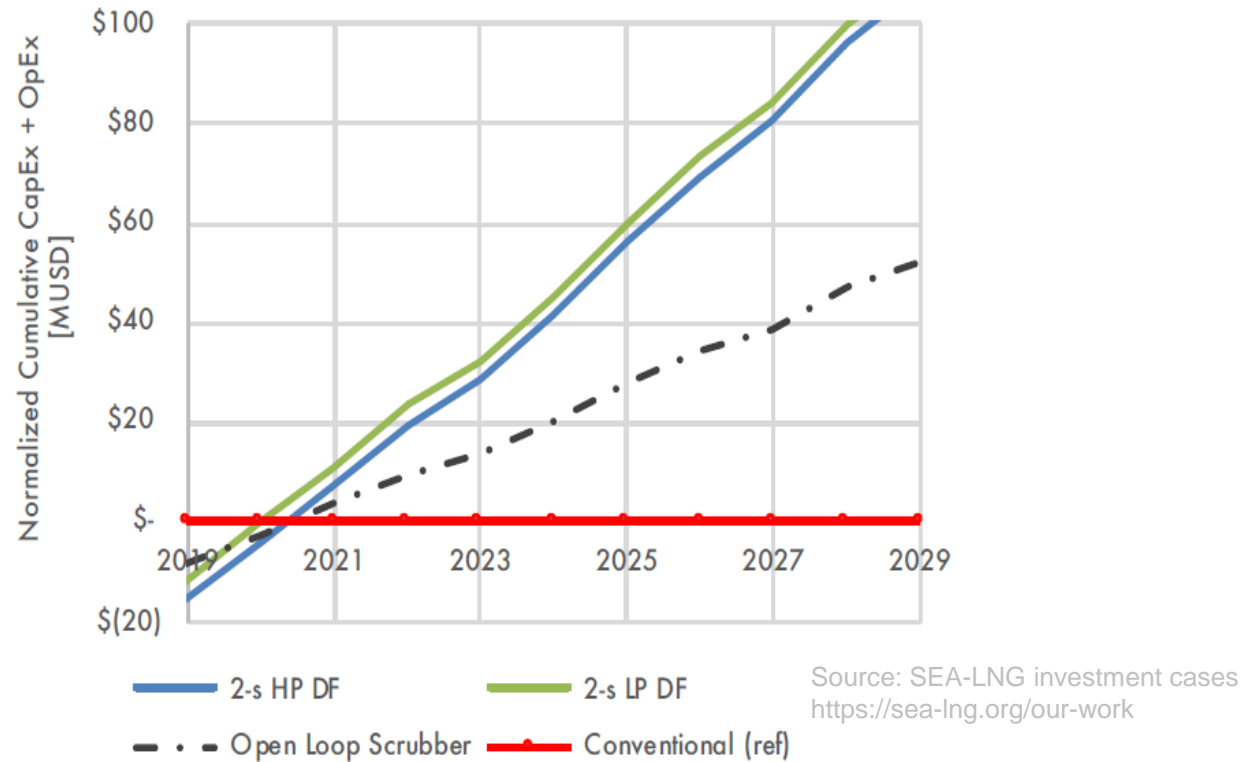
2-stroke slow speed engines: WtW - GHG IPCC -AR5  
[g CO<sub>2</sub>-eq/kWh engine output]



- Up to 21% reduction in GHG emissions on Well-to-Wake basis
- Up to 34% reduction with 20% BioLNG
- Local emissions: 95% reduction in NO<sub>x</sub> and 99% reductions in SO<sub>x</sub> & particulate matter



# LNG - compelling investment case



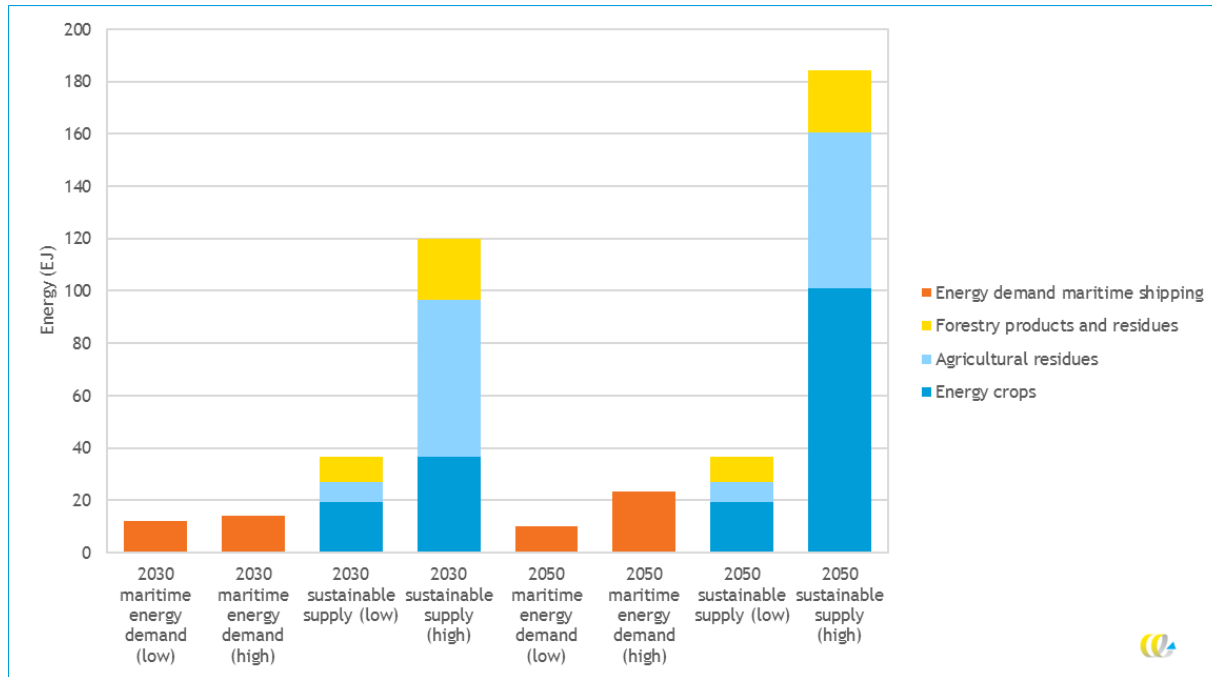
- LNG delivers the best return on investment on a net present value (NPV) basis over a conservative 10-year horizon compared with low sulphur fuel oil
- Paybacks varying from less than one year to five years
- CAPEX for LNG engines, fuel systems and storage tanks continues to fall
- Average of 7 additional years' compliance with Poseidon Principle loan requirements





# LNG - decarbonization pathway via liquefied bio & synthetic methane

*Maritime energy demand vs max sustainable LBM supply in 2030/50*



Source: CE DELFT study, <https://sea-lng.org/our-work>

- Liquefied biomethane (LBM) is scalable
- LBM is globally available
- Availability of liquefied synthetic methane (LSM) will depend on build-out of renewable electricity capacity
- LBM and LSM are likely to be commercially competitive
- LBM and LSM can be used now