



Gas in the transport sector: IGU overview

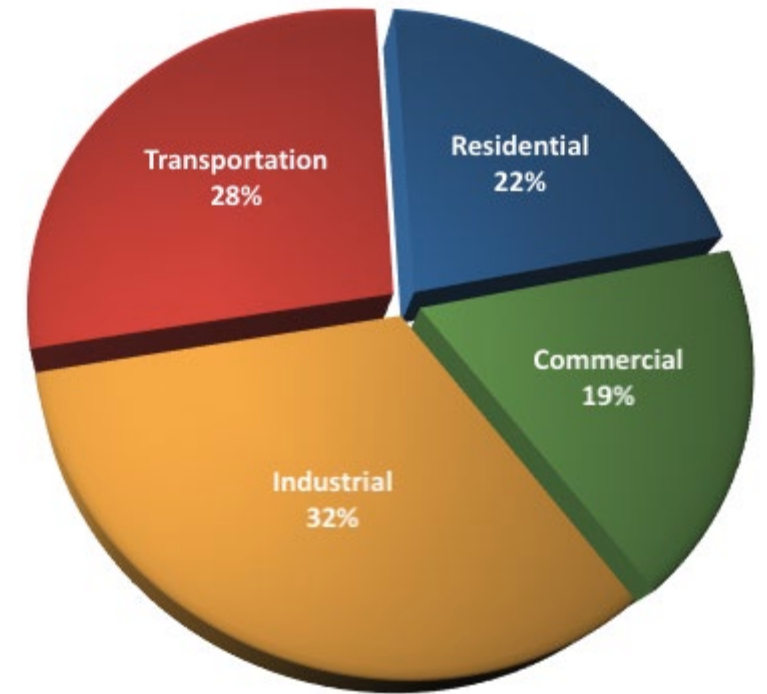
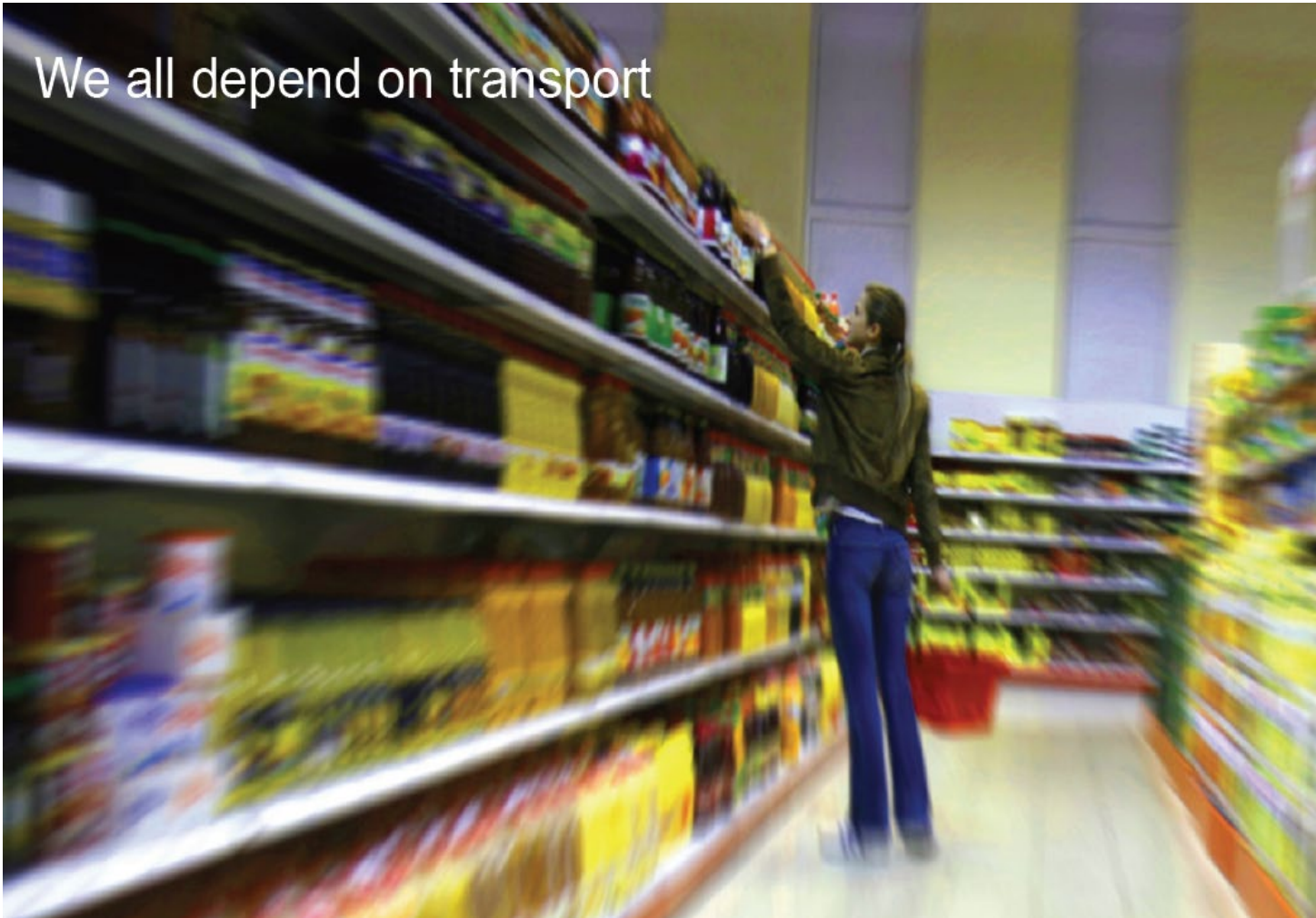
UNECE Workshop

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IGU Secretary General

LNG for transport

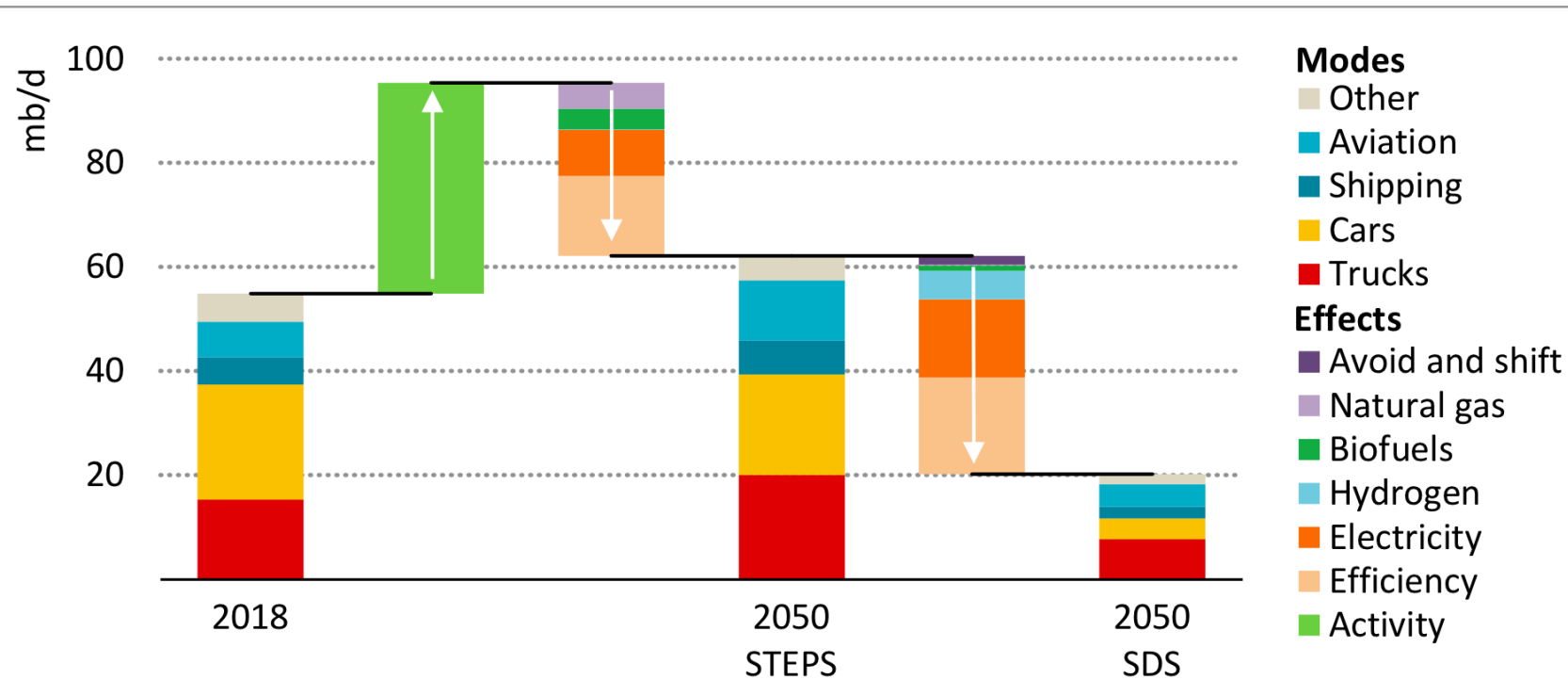
We all depend on transport



Primary energy use by end-use sector

Transport Global situation

Figure 2.19 ▶ Oil demand in transport by mode (left) and change in transport energy use by scenario in 2050 relative to today



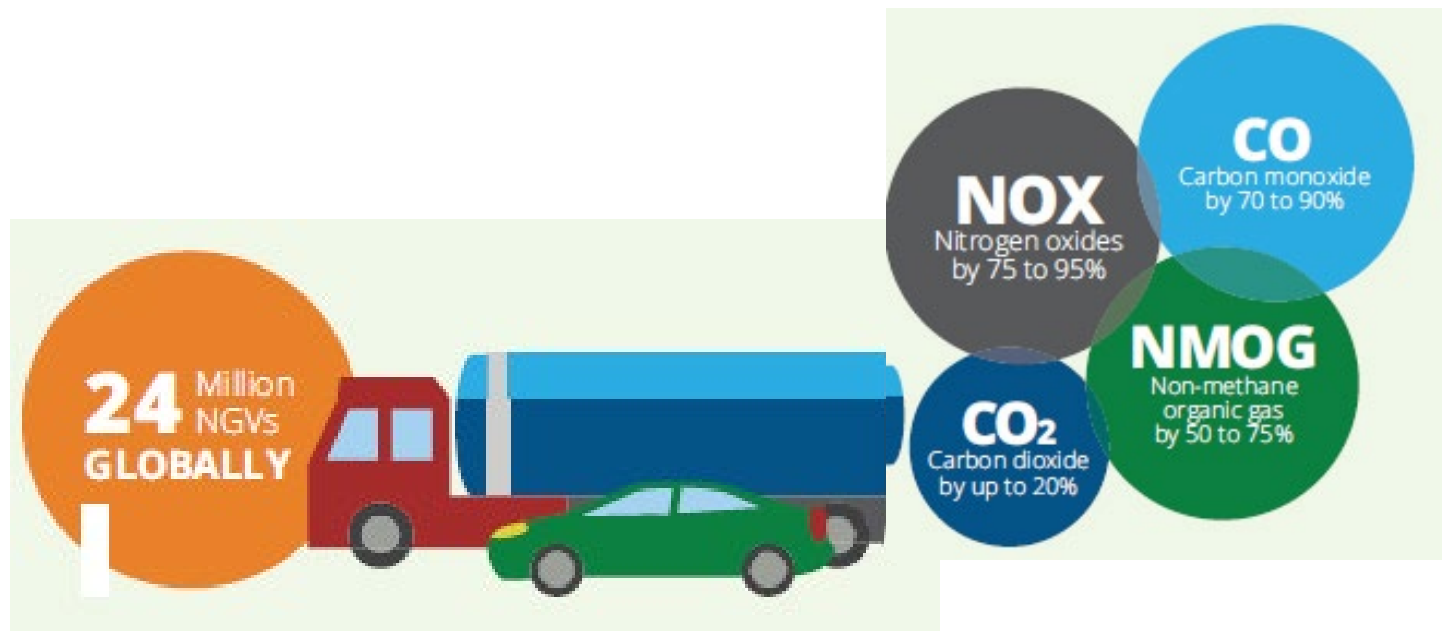
Oil demand in transport falls to 20 mb/d by 2050 in the Sustainable Development Scenario and increasingly concentrates in transport modes where low-carbon options are limited

Source: IEA WEO 2019

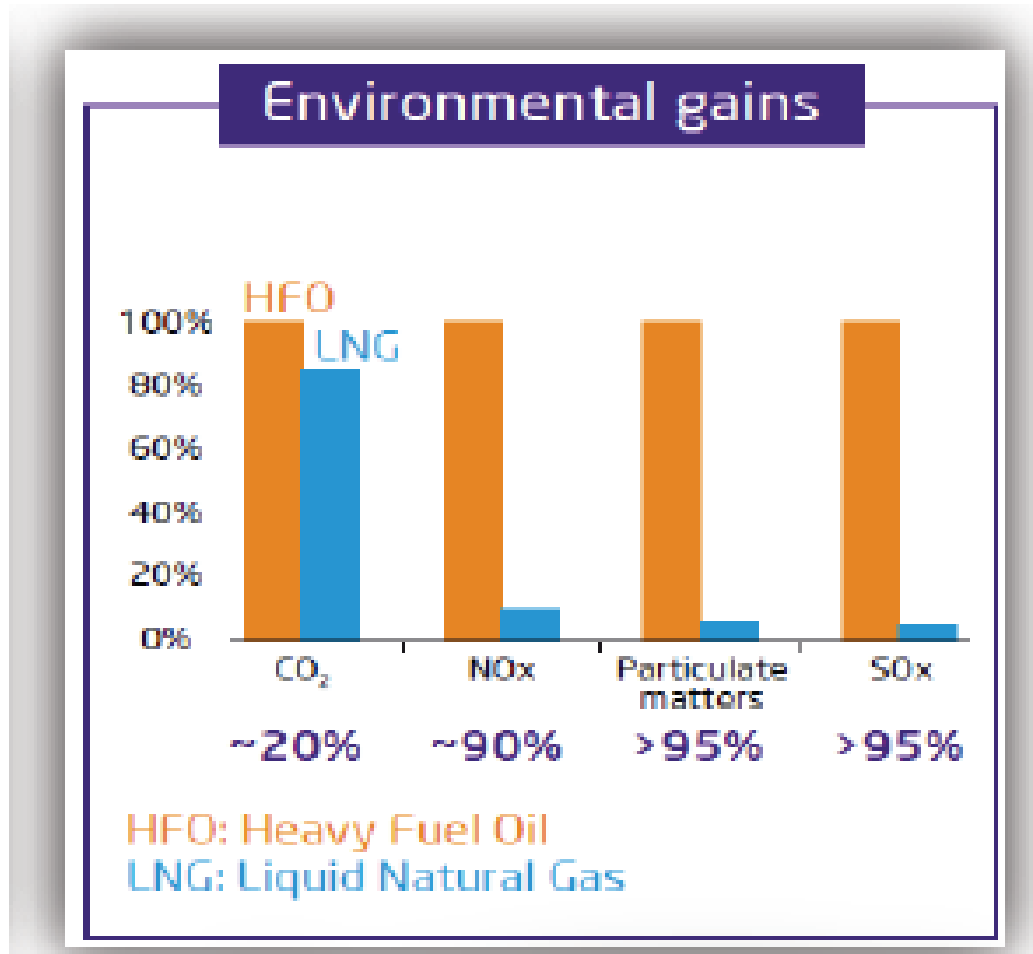
Heavy Haul
Don't have
a roadmap
toward a
100%
Green
Solution

+ 50%
emissions
came from
Heavy Haul
sector

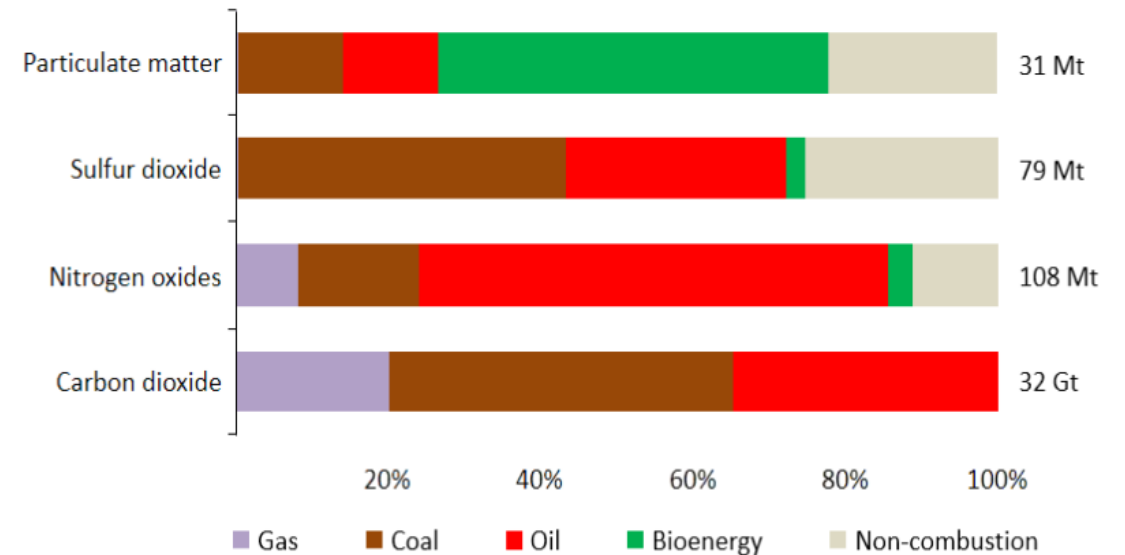
Natural Gas fuels clean transportation



LNG for transport: huge environmental gain



Share of gas in total energy-related emissions of air pollutants and CO₂, 2015

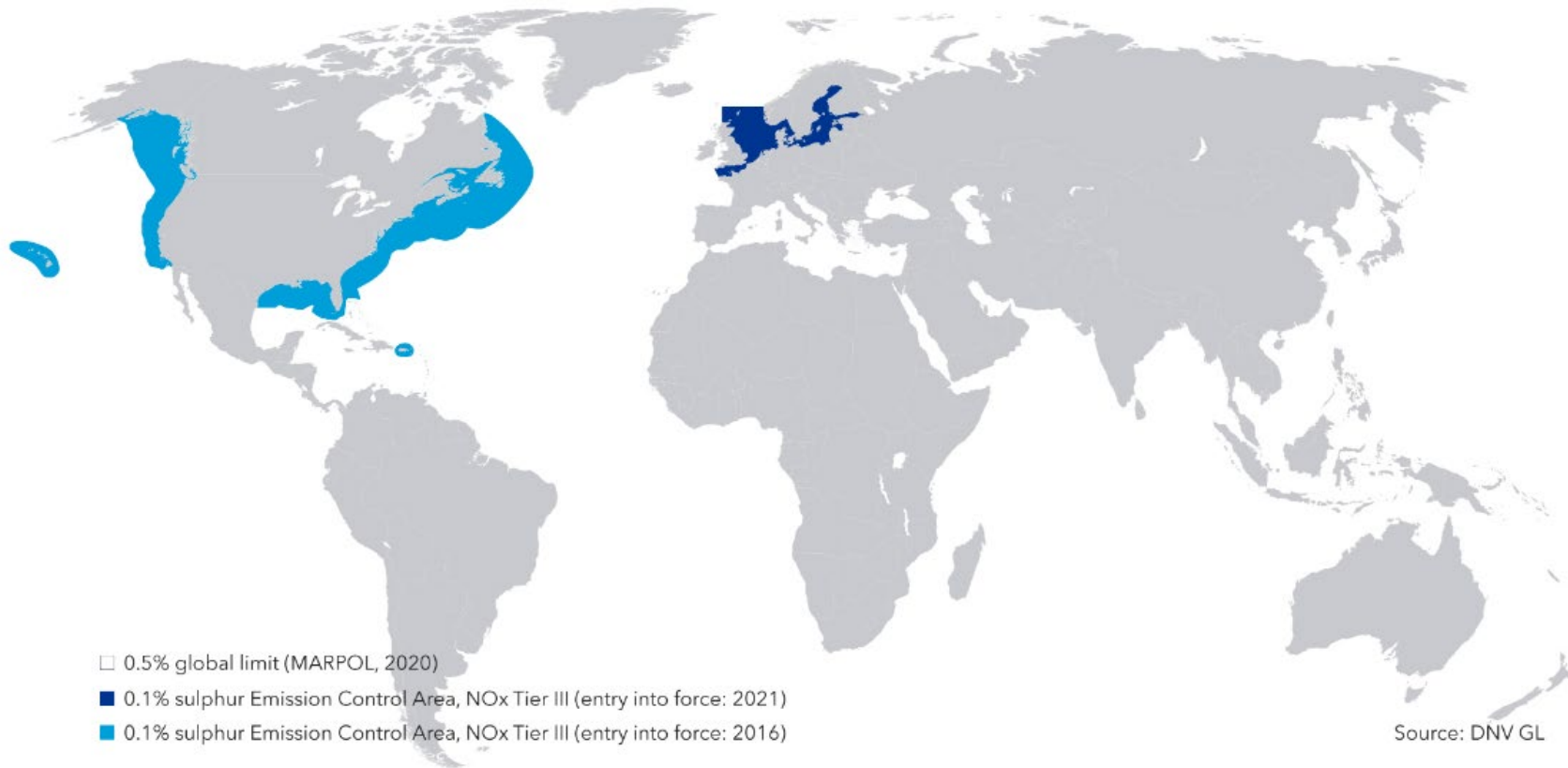


Compared with other sources, natural gas makes only a minor contribution towards today's emissions

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LNG for transport: ECAs to be extended IMO target to 2030 and 2050

Life Cycle GHG Emissions Study on the Use of LNG as Marine Fuel



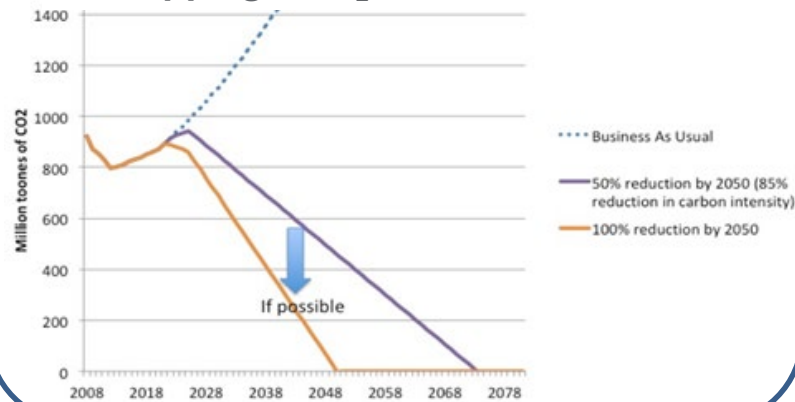
Maritime Sector specific situation

At global level, various international bodies have decided on targets for reducing greenhouse gas emissions, in particular IMO has intervened on maritime emissions.

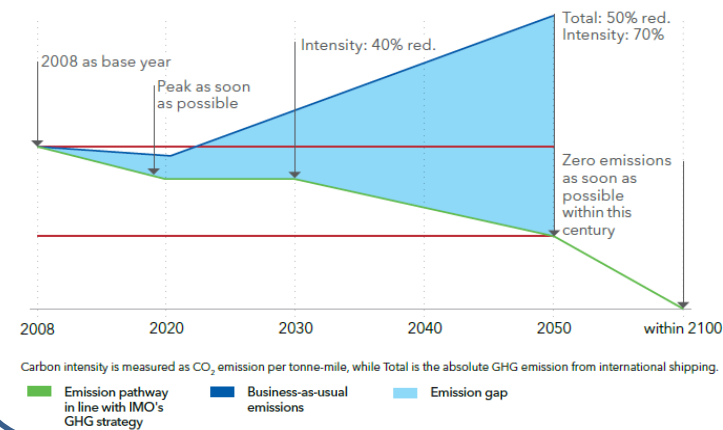
GreenHouse Gas



Pathways for international shipping's CO₂ emissions



GHG emissions Targets IMO (MPC72)



LNG for maritime transport: competitive fuel

LNG is the only competitive and widely available marine fuel option today that can act as a strong foundation for future emissions reductions.

LNG provides an answer to shipping's challenges now and in the future.

LNG is commercially viable and scalable alternative marine fuel and can enable the shipping industry to remain competitive while phasing-out emissions this century.



LNG for maritime transport: Bunkering

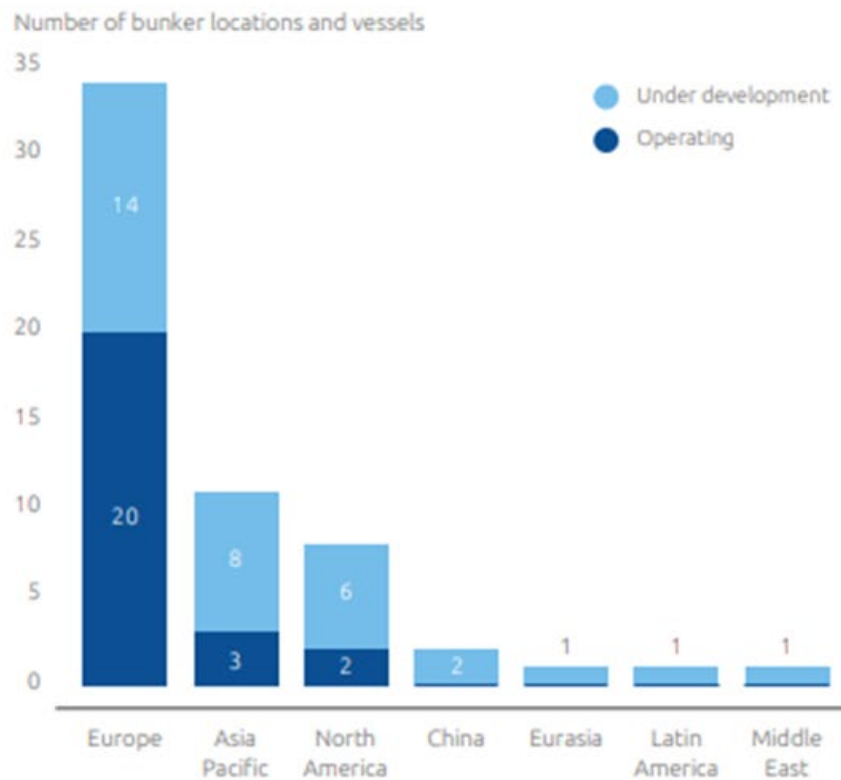
LNG far out-performs conventional marine fuels on a local emissions basis which is particularly important in regard to human health issues in ports and coastal areas.

The use of LNG as a marine fuel, depending on engine technology, offers greenhouse gas (GHG) emissions reductions of up to 21% on a Well-to-Wake basis and 28%, Tank-to-Wake, including the impact of methane emissions when compared to conventional marine fuels.



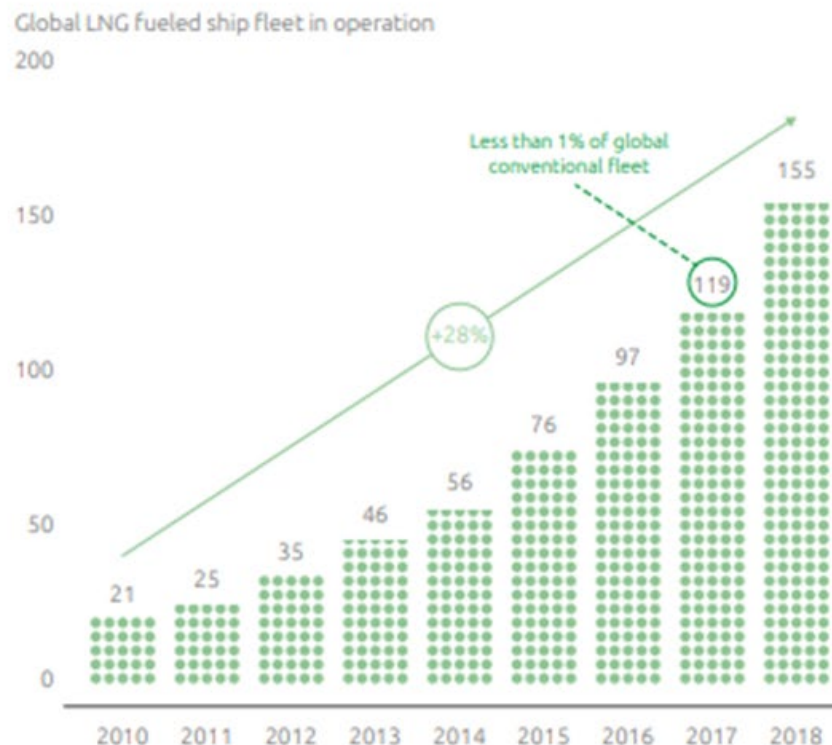
LNG Bunkering: a new and growing market

Access to LNG bunker fuel concentrated in Europe, growing globally



Source: SEA/LNG, DNV GL, IEA, UNCTAD, BCG analysis.

The global LNG fleet is small, though growing

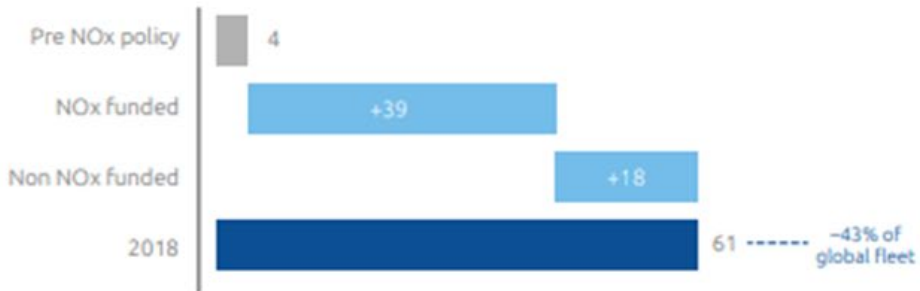


NORWAY LNG BUNKERING: NOX FUND FACILITATED DEVELOPMENT OF NORWAY AS A WORLD LEADER IN LNG BUNKERING

Impact: Norway hosts ~43% of the world's LNG fueled ship fleet and has built large refueling infrastructure

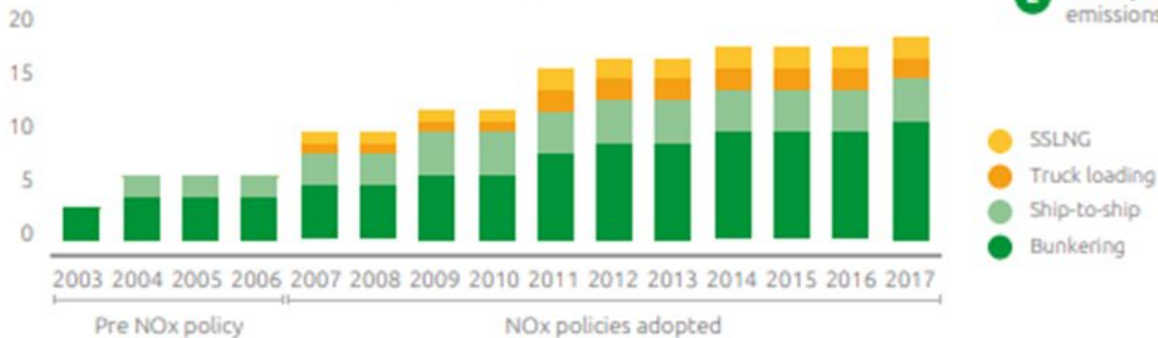
Largest LNG fueled vessel fleet in the world

Norwegian LNG fueled ship fleet



Broader investment in infrastructure followed policy adoption

of Norwegian marine LNG refueling facilities by type



Source: OIES, EDF, BCG analysis.

Drivers & lessons: well-designed local pollution policy can foster strong LNG bunkering adoption

Policy encourages operators to participate and comply with program

NOK per kg of NOx



- Fund fee much lower than tax.
- Members must develop long-term abatement plan to join fund.
- Fees used to support emissions reductions measures.
- Penalties levied if fund member fails to meet commitment.

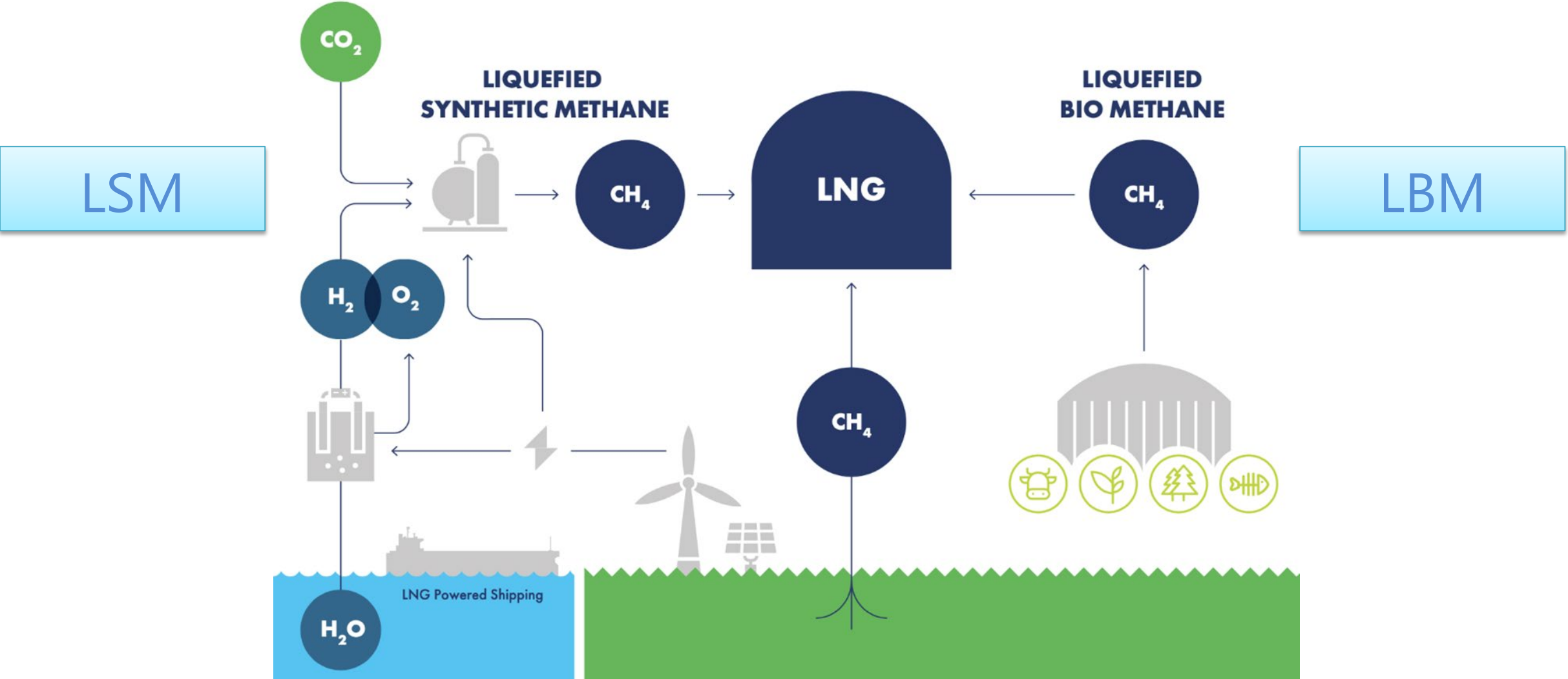
Lower fee and penalty system are key to NOx fund's success

- 1 Large difference between fund fee and NOx creates strong incentive to join fund
- 2 Penalty structure encourages fund participants to meet emissions abatement commitments



Figure 6: Evolution of SSL vessels fleet operating in Europe

Second step: LNG offers a decarbonisation pathway for the global shipping industry



Second step: LNG offers a decarbonisation pathway for the global shipping industry

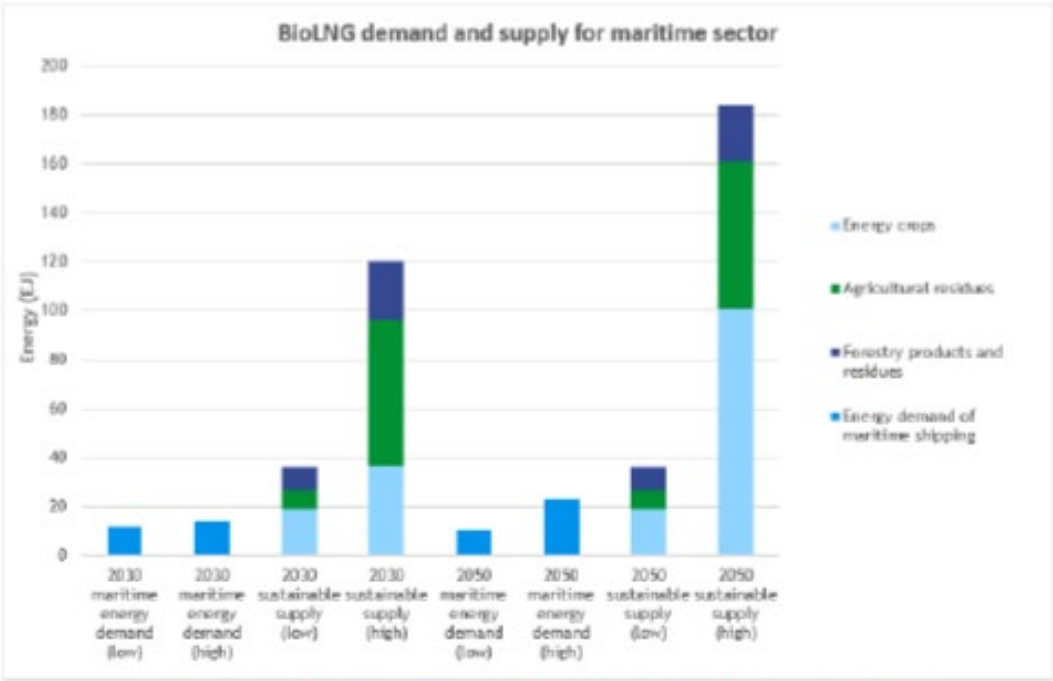
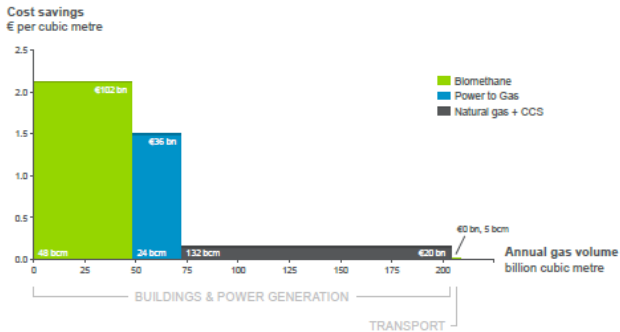
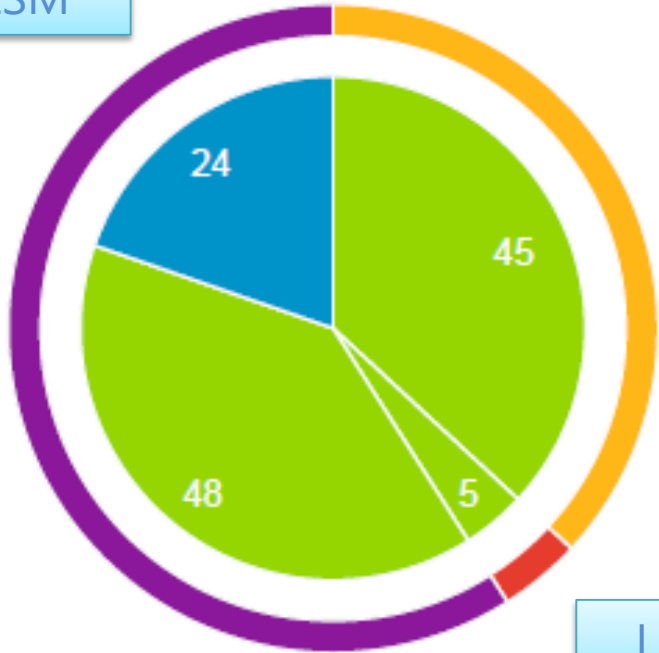


Figure 2: BioLNG demand and supply for maritime sector, 2030 and 2050 scenarios

LBM offer could over the demand



LSM



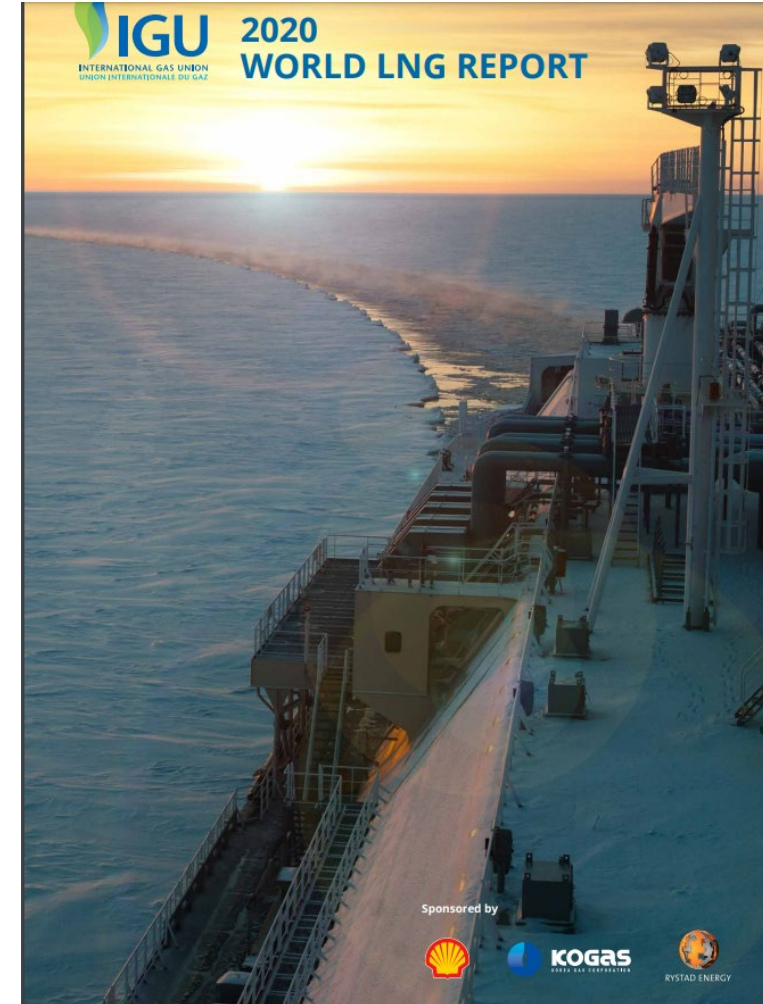
- Biomethane
- Power to Gas
- Industry
- Transport
- Buildings and Power generation

LBM

Allocation of renewable gas over various sectors in billion cubic metres of gas

How is regional bunkering infrastructure developing and are there any discrepancies the industry should consider?

Growth opportunities will continue to be most relevant in regional shipping, with larger international shipping opportunities expected in the future



LNG – THE REALITY

LNG engine technology is:

- safe, with 10's of millions operating hours experience,
- mature, used as a marine fuel for over 50 years ,
- commercially viable, as proven by a growing order book across most vessel types,
- readily available, with rapidly expanding supply of LNG globally,
- scalable, bunkering available or planned to be virtually all of the world's major bunker ports,
- fully compliant with existing legislation around the world,
- removes virtually all risk of ocean contamination in the event of a marine fuel spill accident,
- eliminates SOx pollution thereby preserving human health,
- reduces NOx emissions by 95%,
- drops Particulate Matter emissions by nearly 99%,
- Cuts GHG emissions by up to 21% on well-to-wake basis, 28% on a tank-to-wake basis,
- Offers a long-term pathway towards a zero-emissions shipping industry through bio and synthetic sources of LNG,
- Future-proof, ready NOW. Waiting is not an option if we are to clean the air and reduce GHG.





Thank you

