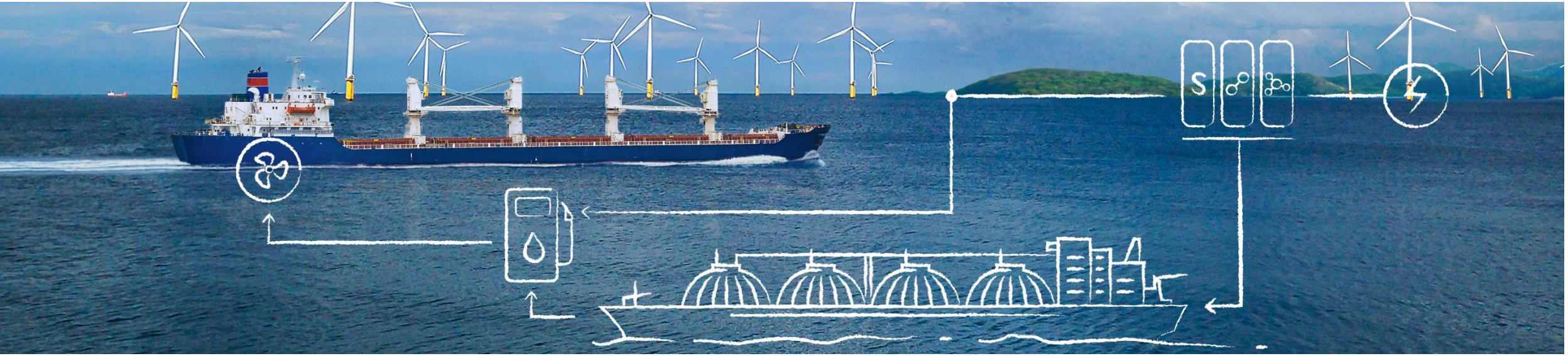
DNV·GL



MARITIME

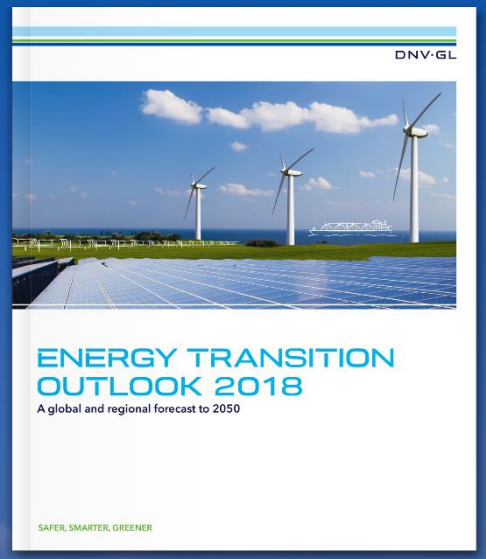
Role of the classification societies in the context of the new Strategy

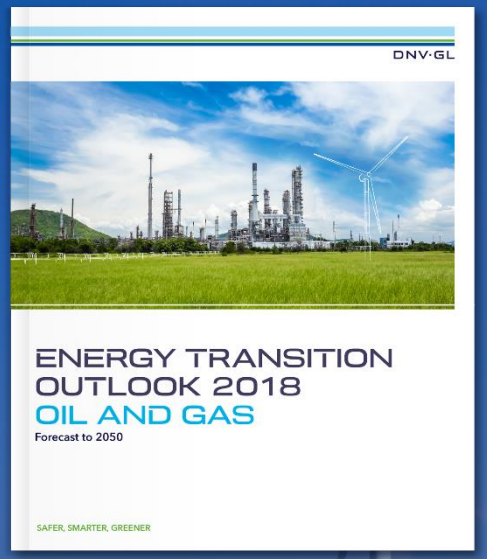
International Workshop GHGs and Shipping, CIL - MPA

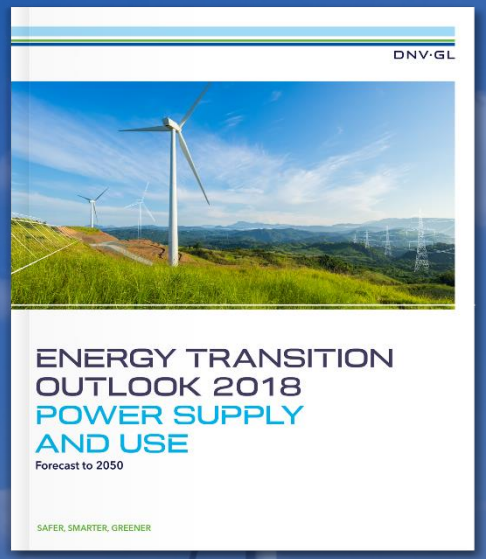
Denzal Hargreaves

13 November 2018

FORECAST TO 2050 - SUITE OF PUBLICATIONS



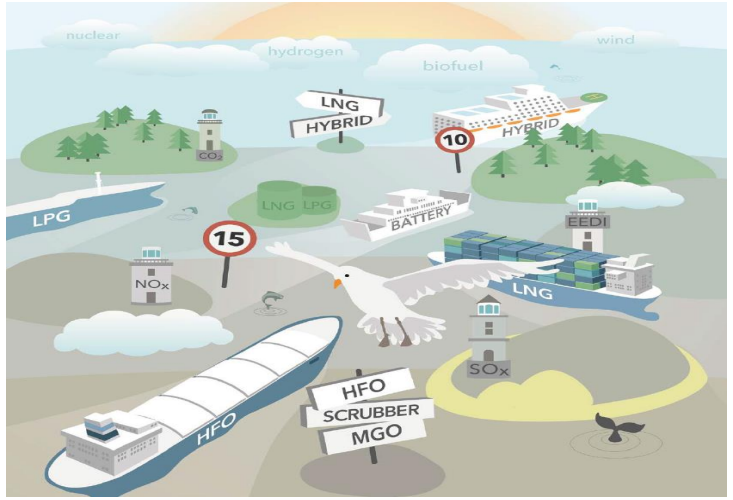




Maritime forecast to 2050 provides outlooks for key drivers

Regulations

Technologies & Fuels

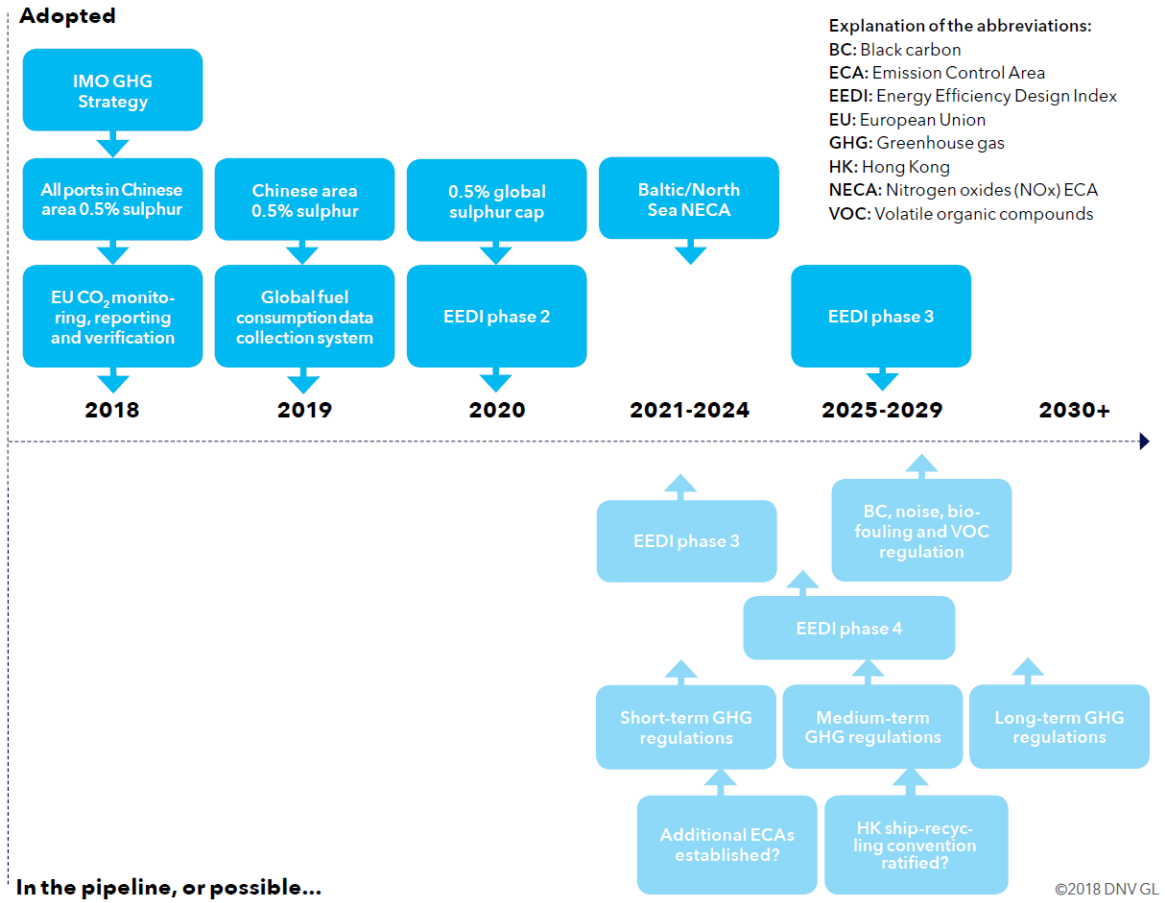


Goods to be transported

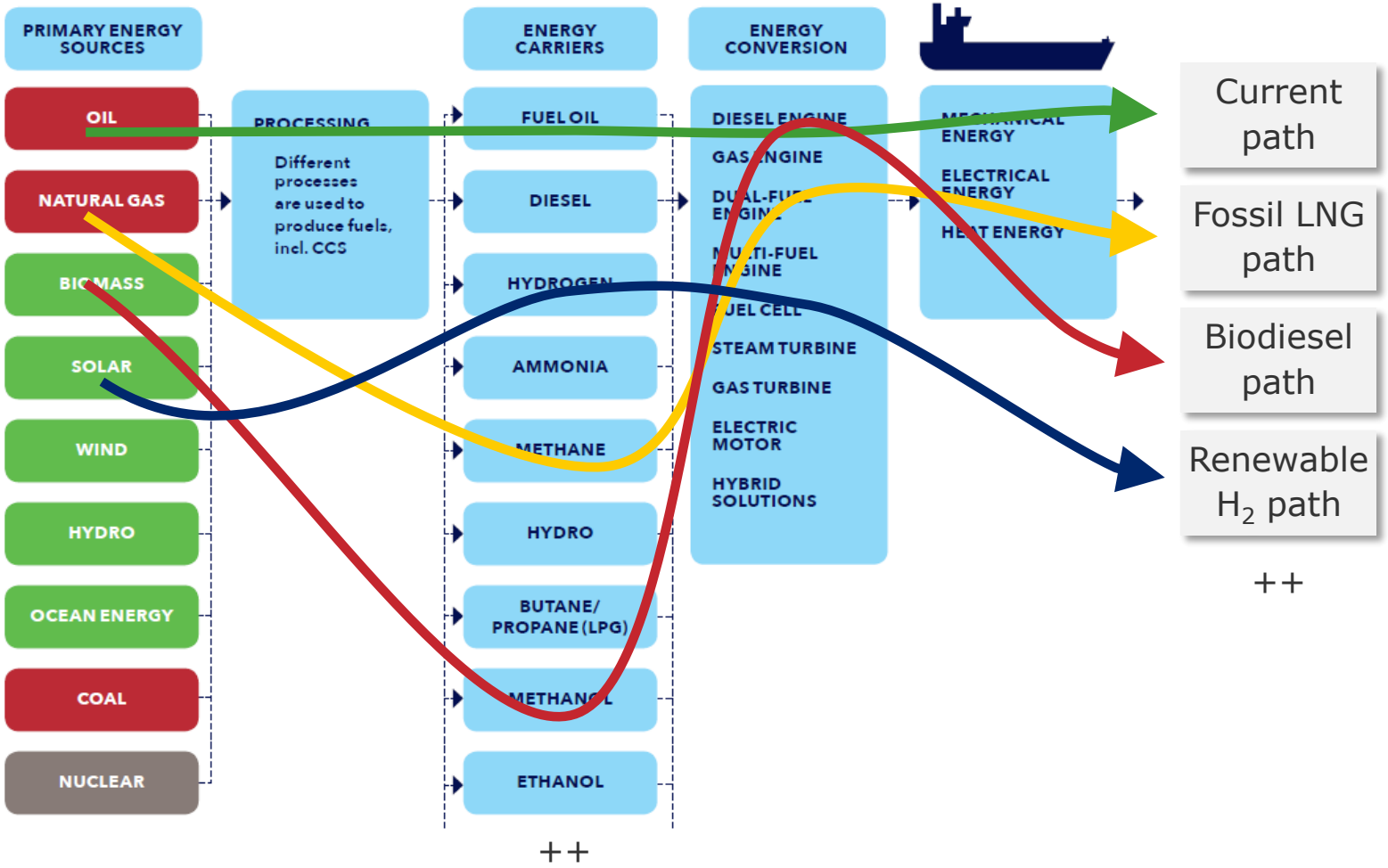
Shipping has experienced a surge in environmental regulations over the past decade, which is expected to continue

- **Safety regulations** expected to improve incrementally, with focus on:
  - New environmental technologies and fuels
  - Digitalization including autonomy, control systems, and cyber risk
- Other stakeholders' expectations:
  - **Consumer preferences** and pressure from investors, non-governmental organizations, politicians, and the general public
  - **Climate-risk** assessment and disclosure
  - Significance of **sustainability challenges** will increase over the next decades
  - Shipping companies have an opportunity to respond strategically to these signals and create **business benefit and value**

Timeline of adopted and possible environmental regulations towards 2030



Alternative fuel paths - difficult to identify 'winners and losers'



Key aspects

Primary energy sources:

- Renewables, nuclear?

Processing:

- Captured carbon to produce electro-fuels?

Which energy carriers:

- Liquid, gas, hydrocarbons?

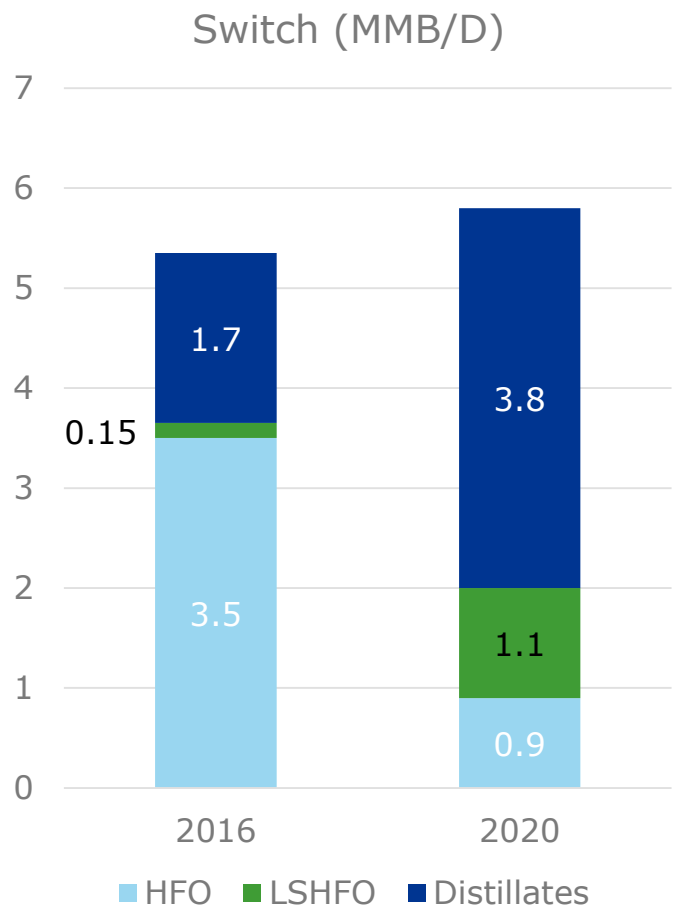
Which energy converter:

- Internal combustion, fuel cells, electric motors?

Inspired by Brynolf S. (2014), 'Environmental assessment of present and future marine fuels'

Source: Maritime Forecast to 2050, DNV GL 2018

Switch volumes – Impact from Sulphur Limit 2020

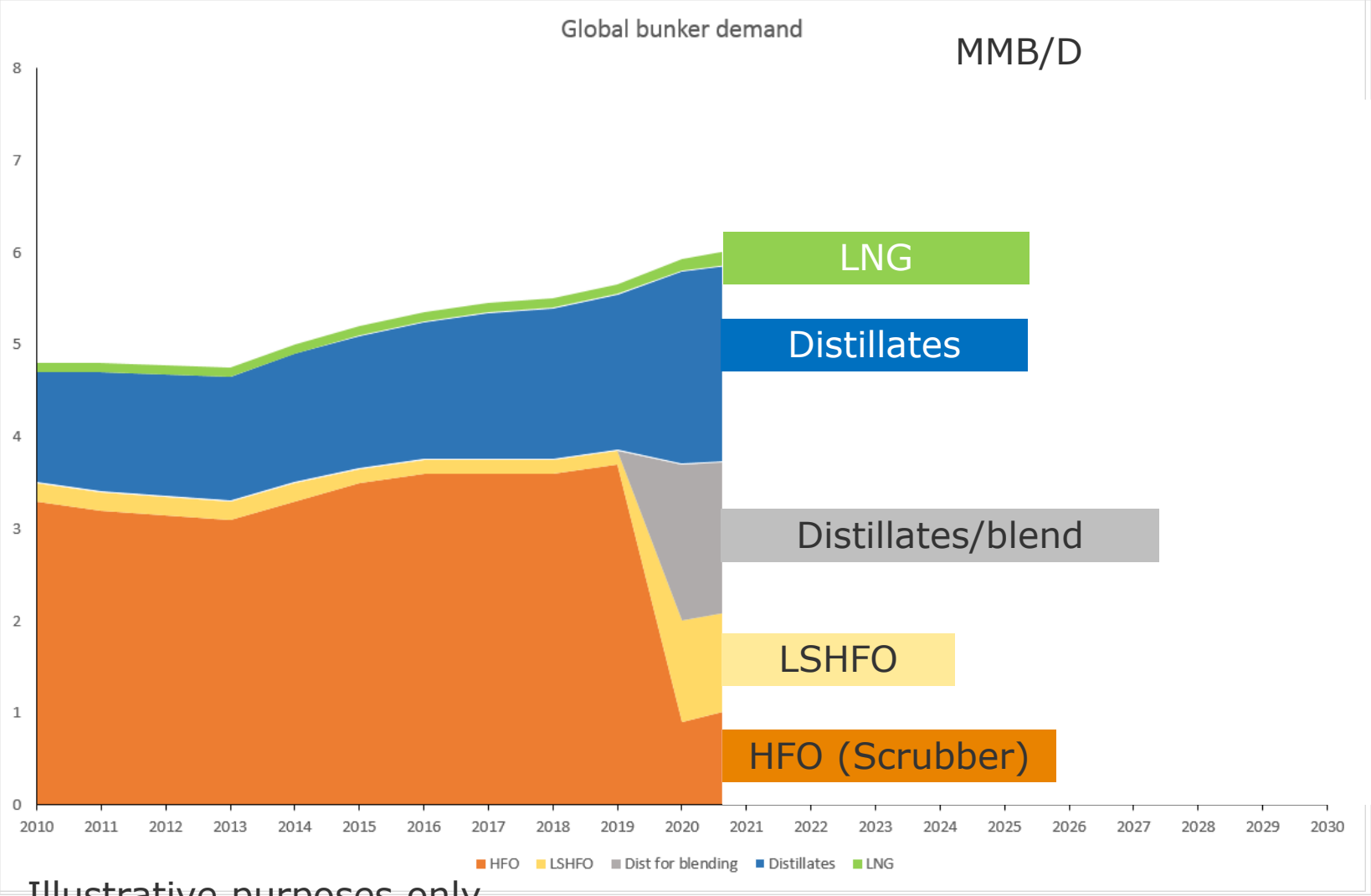


A dramatic shift in the fuel mix

- Will it be possible?

- **Are the refineries preparing?**
- **Theory vs actual availability**
- **Approx 6-8% increase in global gas oil consumption – impact for other industries as well?**
- **Geographical shift in supply?**

Global bunker demand – Towards 2050

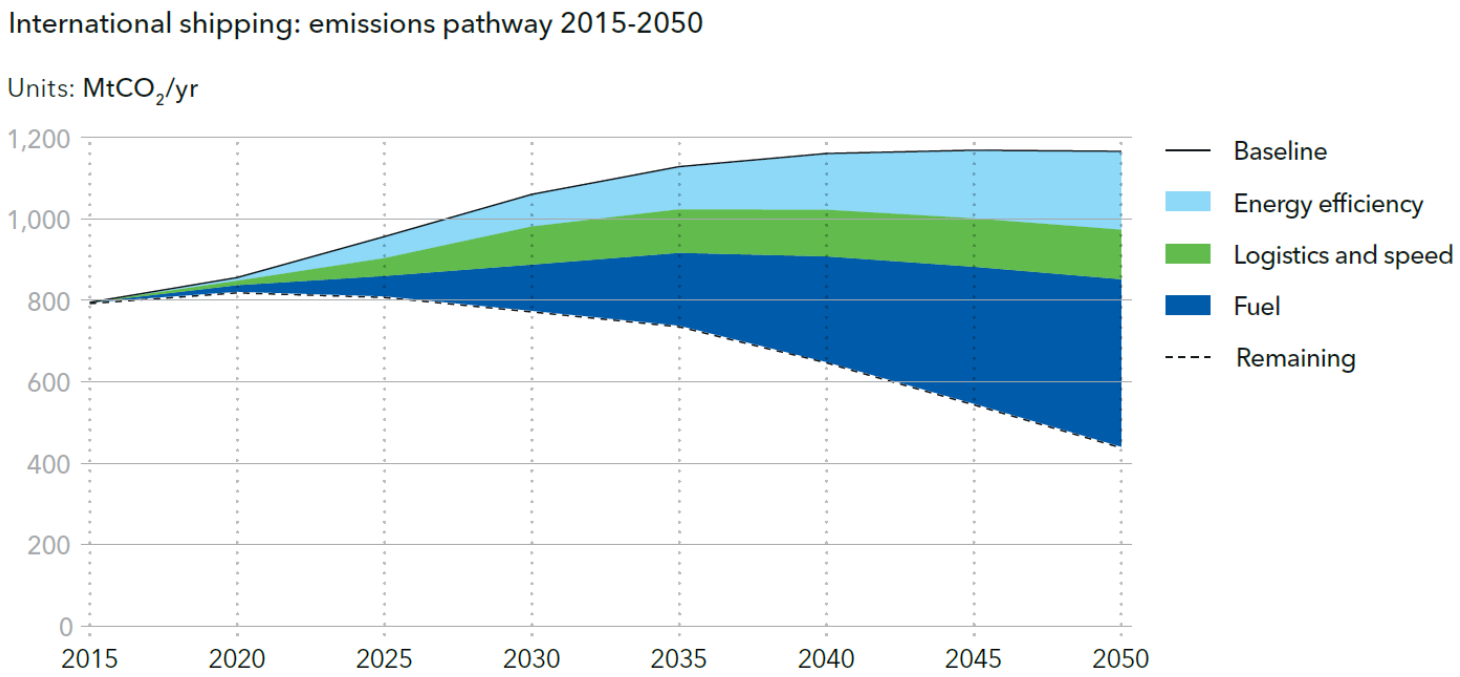


Illustrative purposes only

Source : PIRA energy

Key findings - fuel mix and CO2 emissions for the world fleet

- Reduction of greenhouse gas (GHG) emissions will be the main challenge for shipping in the next decades
  - In the short term, IMO will work on strengthening EEDI and SEEMP
  - IMO will also look at speed reduction, operational indicators, and market-based measures.
  - After 2030, there is a need for large scale uptake of CO_2-neutral fuels
- This will drive innovation and technology development in shipping – the fleet in 2040 and 2050 will be very different

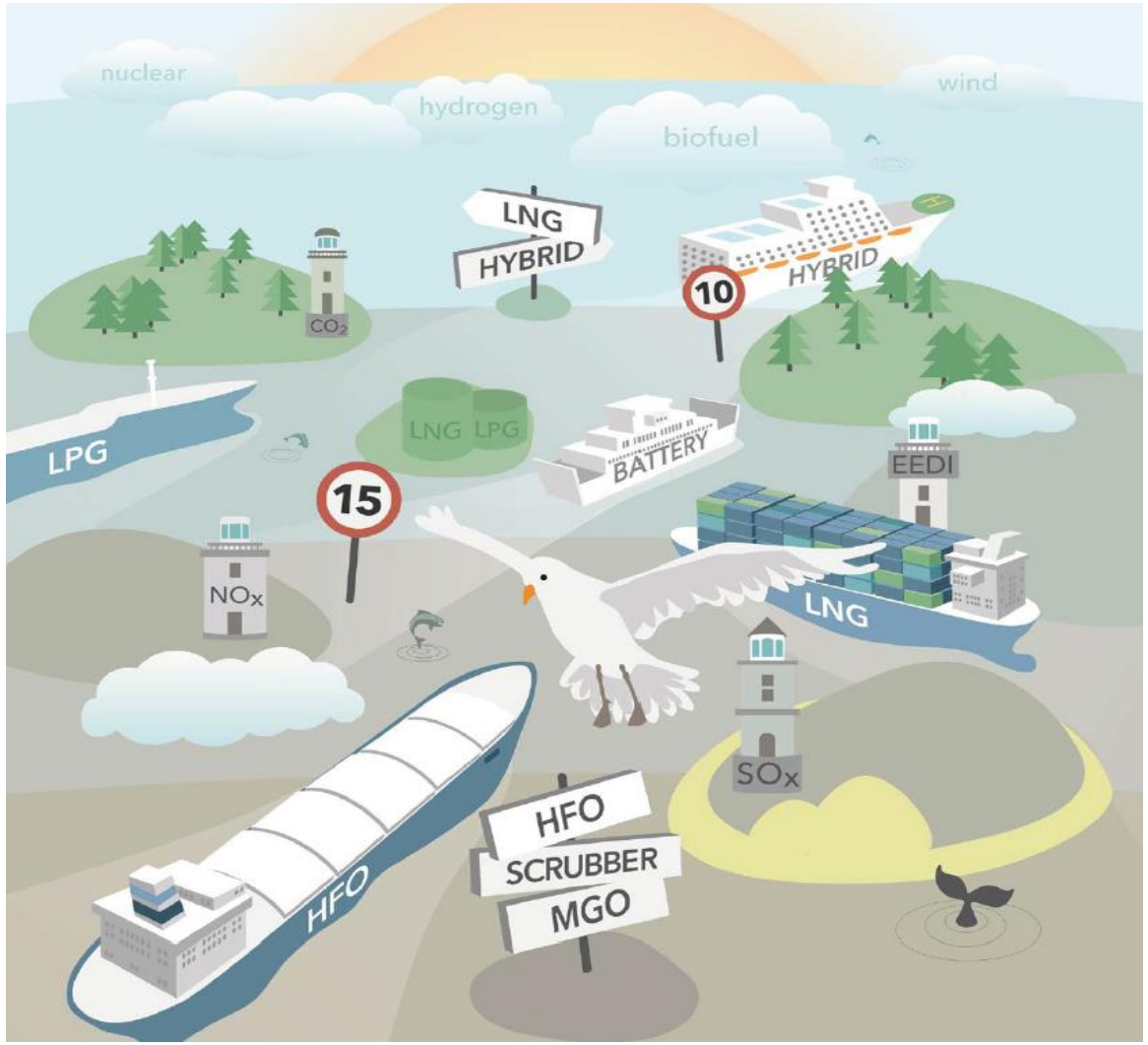


Source: Maritime Forecast to 2050, DNV GL 2018

Competitiveness and CO_2 emissions – ship designs

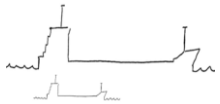
- **Many uncertainties** – potential for big shifts:
  - It is not clear which fuels and technologies will win in the short or long term,
  - But we need to build ships today – how can we make it robust?

- DNV GL has developed a framework to test **competitiveness** under different scenarios – taken into account:
  - Fuel & technology
  - Regulations
  - Risk related to market



There is a range of promising CO_2 reduction measures

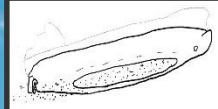
- In addition to **energy-efficiency measures**, reaching the IMO target for reducing GHG emissions from shipping will most likely require widespread uptake of **fuels** with a high GHG reduction potential
- **Digitalization** will be a key enabler for reducing in-effectives, and assisting in prototyping in-mature novel technologies and solutions



LOGISTICS & DIGITALIZATION

- Speed reduction
- Vessel utilization
- Vessel size
- Alternative routes

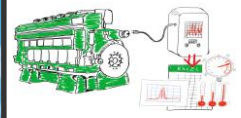
>20%



HYDRODYNAMICS

- Hull coating
- Hull form optimization
- Air lubrication
- Cleaning

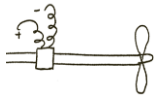
10-15%



MACHINERY

- Machinery improvements
- Waste heat
- Engine de-rating
- Battery hybridization

5-20%



FUELS AND ENERGY SOURCES

- LNG/LPG
- Electrification
- Biofuel
- Synthetic/hydrogen etc.

0-100%

Thank you for the attention!

Contact:

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