

VERT FORUM 2021

ALTERNATIVE BUNKER FUEL IN MARINE

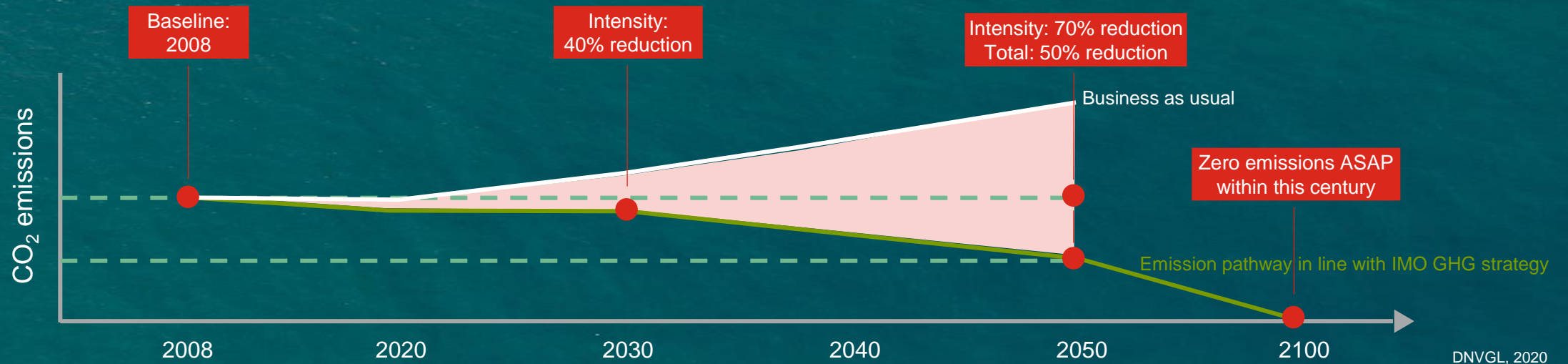
EMISSIONS, PROMISING
SOLUTIONS AND UNCERTAINTY.



INITIAL IMO STRATEGY ON REDUCING GHG EMISSIONS

IMO's GHG STRATEGY AMBITION:

- 🍃 Achieve a 40% reduction of the average carbon intensity by 2030...
- 🍃 ... and a 70% reduction by 2050, compared to 2008 levels.
- 🍃 The industry's total GHG emissions are to be reduced by 50% by 2050.



DNVGL, 2020

HOW DO WE GET THERE?

"NO SILVER BULLET TO THIS PROBLEM" ... NOT YET AT LEAST

- The range of options within new fuels has evolved a lot in recent years and therefore patience, analysis and monitoring are key words for us.

THE 3 PHASES AS WE SEE THEM TODAY:

- Phase 1 (today): Conventional fossil bunker fuels continue as the dominant product.
- Phase 2 (intermediary period): LNG and biofuel appears as good candidates as "transition pathways" but are hardly the future.
- Phase 3: An uptake of carbon-neutral fuels will take place, but not until a clear and robust regulatory framework is in place. Methanol and ammonia looks promising in the longer term (2030-2050) but are still associated with great uncertainty.

Parameter	VLSFO	LNG	LPG	Biofuel	Methanol	Ammonia	Hydrogen
Availability	●	●	●	●	●	●	●
Energy Density	●	●	●	●	●	●	●
Emissions	●	●	●	●	●	●	●
Adoption	●	●	●	●	●	●	●
Infrastructure	●	●	●	●	●	●	●
Safety	●	●	●	●	●	●	●
Price	●	●	●	●	●	●	●
Capital expenditure	●	●	●	●	●	●	●
Commercial readiness	●	●	●	●	●	●	●

Legend

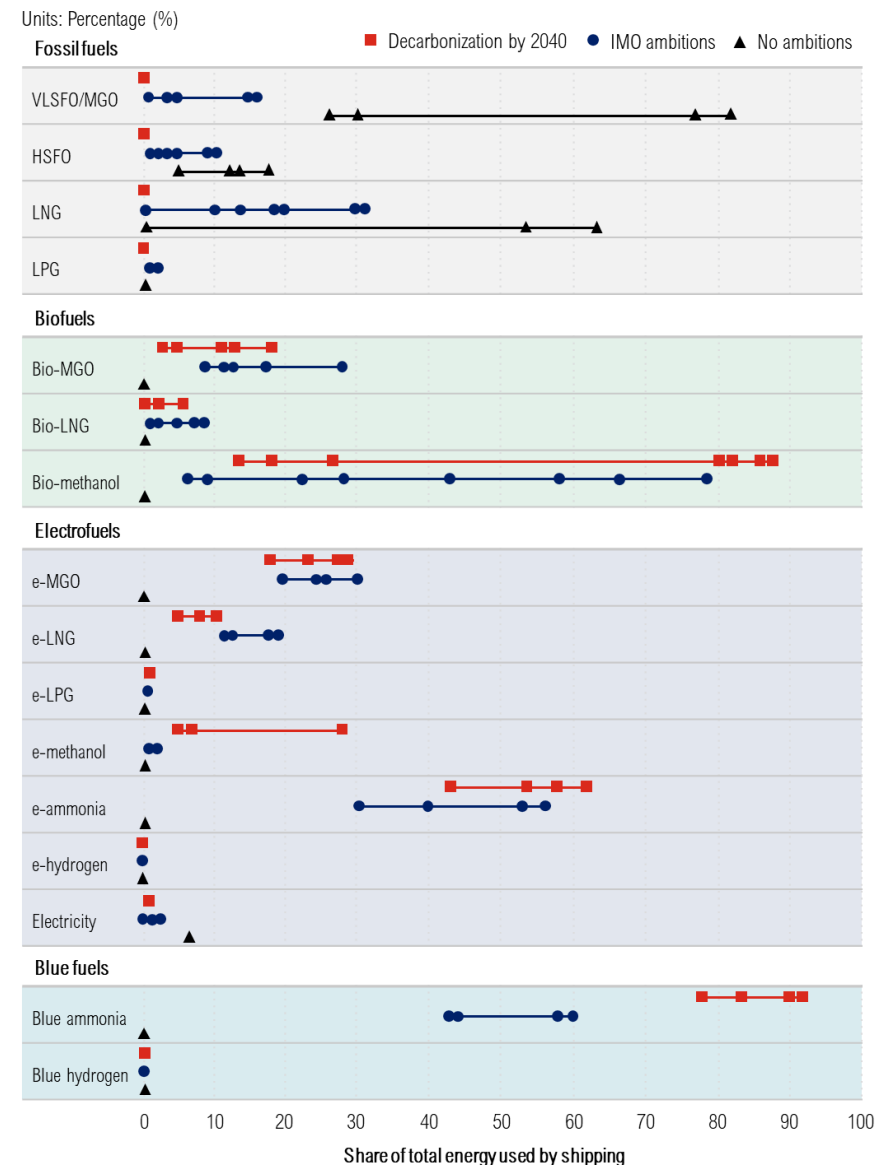
● Positive indication ● Neutral indication ● Negative indication

DNVGL 2020 & Internal study

UNCERTAINTY

UNCERTAINTY DUE TO LACK OF REGULATIONS & GUIDELINES

- The level of uncertainty about predicting the fuel mix in 2030-2050 is much larger and more complex than what we experienced prior IMO2020.
- The momentum of a potential transition is very much dependent on the regulatory framework, as in earlier cases (SECA & IMO2020).
- The model on the right illustrates this, where DNVGL presents three scenarios and the expected effects of different regulatory directions will have on the bunker demand in 2050. The lines illustrate minimum and maximum uptake of fuels.
- Notice the uncertainty around VLSFO/MGO, LNG, bio-methanol og ammonia.

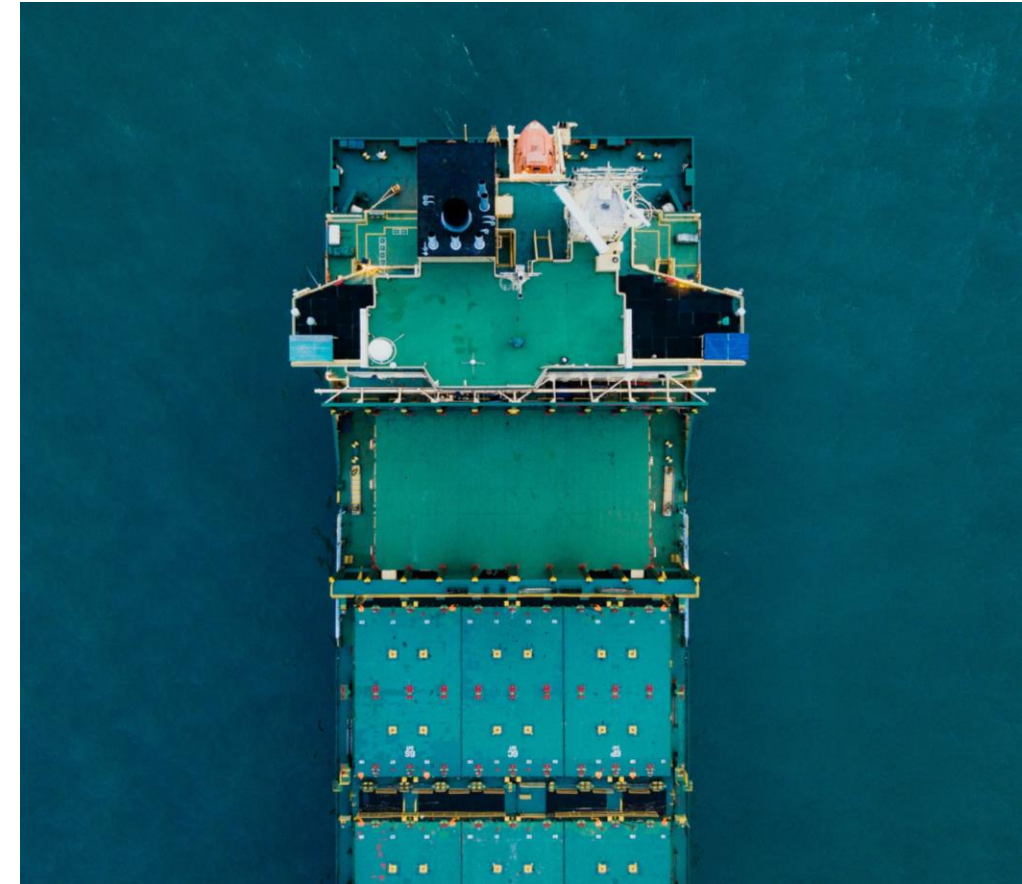


DNVGL, 2020

INCREASED ATTENTION BUT LARGE UNCERTAINTY

HOW DO WE SEE THE DEVELOPMENT?

- Increasing level of attention recently towards alternative fuels in the shipping industry - but still limited actions from owners.
- We start to see a “pull” from our customers’ customers, which may force ship owners to accelerate their decisions on greener fuels.
- Some shipping banks have started to require actions from the ship owners – the Poseidon Principles
- But... large uncertainty about regulatory actions – IMO, EU, RED etc.
- Regulations (or incentives) and price differentials are the dominant drivers of this potential transition.
- Actors in our industry needs to collaborate on projects but guiding frameworks from authorities are needed to establish common ground and direction.



THANK YOU FOR YOUR ATTENTION

