

INTERNATIONAL ENERGY AGENCY STANDING GROUP ON THE OIL MARKETS - PARIS, 23.10.2019

IMO 2020 Sulphur cap

Challenges on the path to compliance

Greek shipping at a glance



- The world's leading shipowning nation
 - The number of Greek-controlled vessels exceeds 4,500.
 - Greece corresponds to 0.15% of global population but controls 21% and 53% of global & EU fleets respectively.
 - Carrying capacity more than doubled between 2007-2018.
 - Greek owners are primarily invested in bulk/tramp shipping, which represents 84% of world seaborne trade in terms of cargo tonne-miles.
 - Predominantly carries staples such as oil, iron ore, gas, chemical & agricultural products.
 - World's largest cross-trader: more than 98% of capacity carries cargoes between 3rd countries.
 - SMEs, often privately owned, family businesses.

IMO 2020 Sulphur Cap



- 01/01/2020: Switch to fuels with 0.5% sulphur content.
- IMO regulates shipowners/operators but not charterers or fuel suppliers.
- Compliance options:
 - Marine Gas Oil / Distillates
 - New compliant but safe fuel blends 0.5% S. max.
 - Alternative fuels (LNG, LPG, Methanol, Ammonia etc.)
 - As an exception, exhaust gas cleaning systems (scrubbers) + HSFO
- Compliance is highly contingent upon worldwide availability of safe, compliant marine fuels.

Inconsistencies from the outset

- The stakeholders in this venture are trying to achieve the objectives at different speeds (asymmetric legal requirements and obligations).
- Safety was not a term of reference in the impact assessment process prior to the adoption of the IMO's 2020 Sulphur cap.
- Submissions to IMO for an Experience Building Phase were ignored.

Transitioning to low-sulphur fuels

Worldwide availability not guaranteed



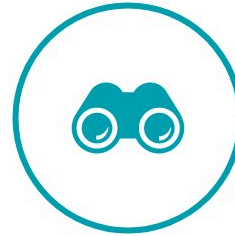
Fuel blends to dominate market

- Refineries have to remove close to 80% of sulphur from crude oil to meet requirements of IMO sulphur cap.
- IEA predicts that from 2020, refineries will blend high sulphur fuel oil with gas oil to create the new very low sulphur fuel oil.



Global availability

- Refining industry struggling to adapt to new demand landscape.
- Many refineries have not made the substantial investments required to provide fuels with the required lower sulphur content.
- Safe compliant fuel may be available in some hubs but there are serious doubts about worldwide availability.



Negative future projections

- IEA predicts deficit in 2020 equivalent to 16% of total bunker fuel deliveries => **does not allow for a complete switch to the new fuels before 2024.**
- Recent US economic analysis anticipates between 15% and 30% non-compliance rate worldwide.



Responsibility of oil companies

- Responsibility for availability of safe compliant fuels rests solely with oil companies, refineries and bunker suppliers, **not with the ship owners & operators.**

Transitioning to low-sulphur fuels

Disruptions to non-marine sectors



- Implications (e.g. in connection to price and availability) also for society at large.



- In 2020, collapsing demand for fuel oil & rise in demand for MGO & VLSFO.
- Gasoil & diesel production of 29.8 mb/d, mostly for transportation, heating & manufacturing sectors.
- Around 1.9 mb/d of gasoil available for shipping vs demand of around 2 mb/d => shortfall of 100 kb/d.
- Gasoil prices may increase & incentivize higher gasoil yields.
- Production gap would be even greater if compliance with IMO regulations is higher than anticipated.



- Higher gasoil prices will curb growth in marine bunker demand and demand from onshore users (car and truck transportation, manufacturing & heating).



- Gasoil prices could increase by one fifth (20%) in 2020 under IEA base case scenario. If compliance is strictly enforced in 2020, gasoil prices could more than double.

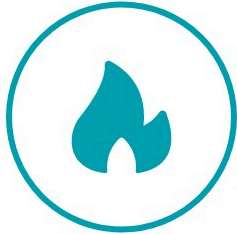
Bunker Fuel Market Landscape in 2020



- It is estimated that 3.5 mb/d of bunker fuel demand will be impacted by these changes in 2020, the largest ever transformation in the global oil products market.
- Refining industry struggling to adapt to new demand landscape where fuel oil demand drops sharply by 60% in 2020. MGO consumption almost doubles and new VLSFO is introduced.
- Despite gasoil supply increase in 2020 as refineries maximize output, this will be insufficient to meet all of the demand growth from the marine sector.

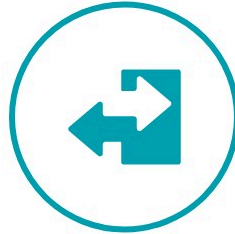
Transitioning to low-sulphur fuels

Safety: Major concerns for ship & their crews



Low flashpoint

- Fear of unstable & unsafe fuels with lower flashpoints than the minimum required by SOLAS (60 °C).



Compatibility

- Incompatibility of different batches of blended fuels, with possible far-reaching consequences for safety of ships & their crews.



Inadequate safety margins

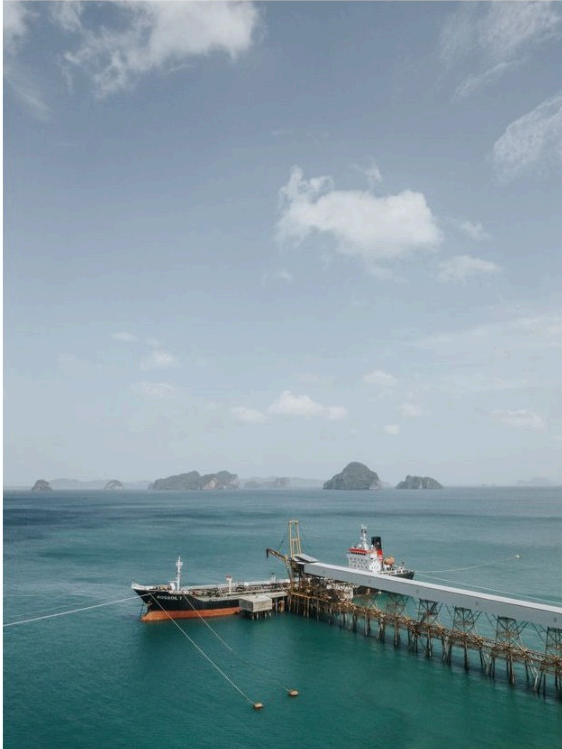
- Inadequate safety margins for cat fines.
- Extended ignition delays due to poor combustion characteristics.



Off-spec fuel

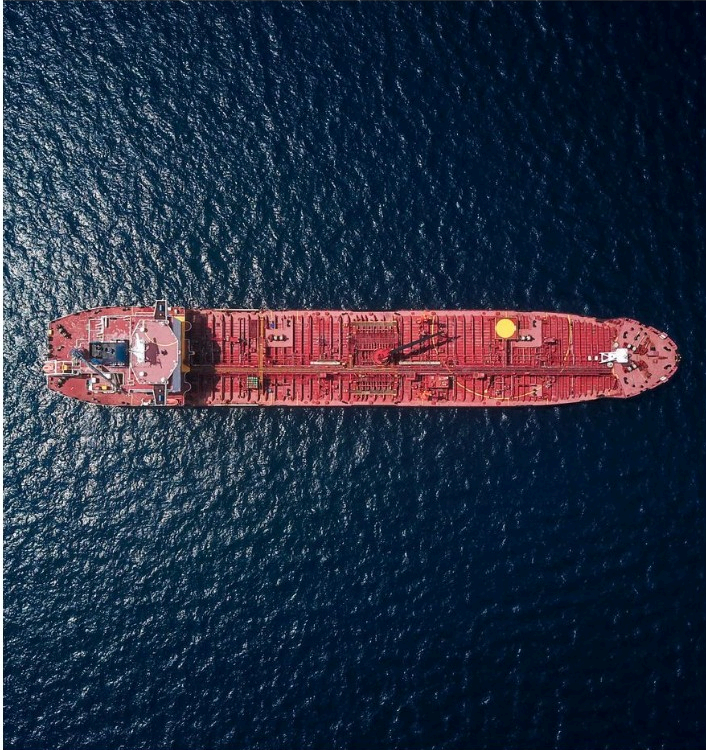
- Lack of international standardization.
- Only Singapore has bunker supplier licensing scheme in place, despite industry requests for worldwide roll-out.
- bunker suppliers only providing limiting guarantees about their products.

Bulk/tramp shipping to bear the brunt



- Bulk/tramp shipping is the workhorse of global trade and is by nature itinerant. Far higher number of remote and diverse destinations than regular liner services => Fuel needs to be available worldwide!
- Unpredictability of trading patterns coupled with the expected market-wide practice of fuel blending jeopardizes crews & ships. Different batches of off-spec fuel may experience compatibility issues, could lead to engine blackouts, ships drifting without power on the high seas.

Bulk/tramp shipping to bear the brunt



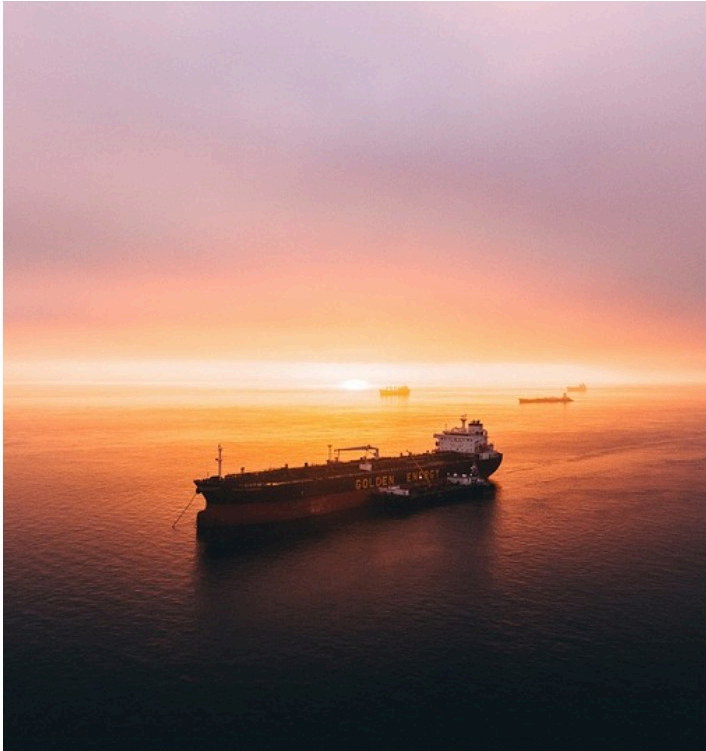
- Compliant fuel will not be available worldwide come 2020. In case of non-availability ships have to bunker MGO, if available, or use a Fuel Oil Non-Availability Report (FONAR)?
- But FONARs are not a panacea. Depending on route & ports of call ships may encounter non-availability several times/year.
- What happens to excess HSFO on board at next port of call? Is it sold? Treated as waste? How often will the tanks be cleaned? At what cost? How long does cleanup last? How often will a ship encounter non-availability of complaint fuel around the world?

Bulk/tramp shipping to bear the brunt



- Ahead of 2020 implementation date, around 30,000 seagoing vessels are expected to have to undergo tank cleaning/preparation.
- IMO and industry guidance on fuels that are not readily available is not enough. Responsibility and obligations rest with fuel suppliers and charterers. Charterers' commercial terms are slowing down preparations for 2020.
- Vessel are competing for limited shipyard space already taken up by ships fitting scrubbers and/or ballast water treatment systems. In short - chaos!

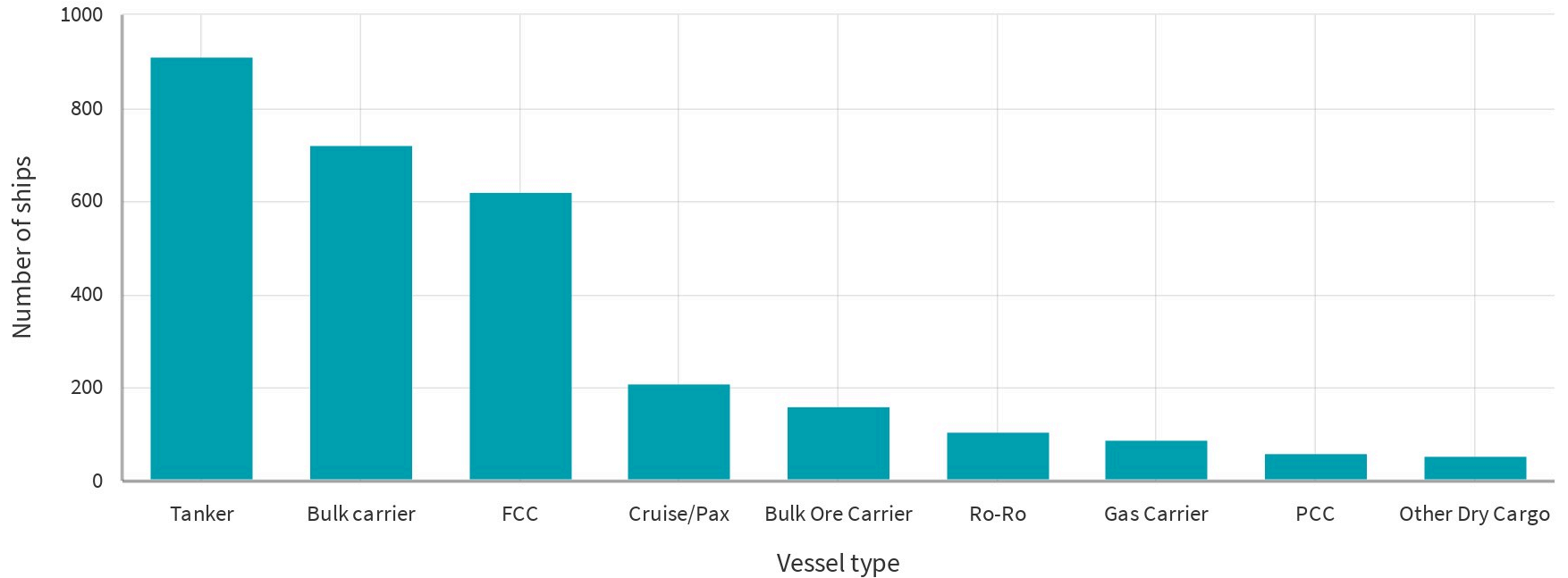
The tide has turned for scrubbers



- Scrubbers are a regulatory exception that shifts pollution from the sky to the sea and increases CO2 emissions. Increasing scrutiny and restrictions indicate that they will gradually be phased out.
- Scrubbers create a two-tier market and distort competition between shipowners (ships with scrubbers vs. ships without scrubbers).
- Ships fitted with scrubbers will bolster demand for HSFO, as it is estimated that installed units will number 5.200 by end-2024. Today around 3000 vessels have already been fitted with a scrubber.
- Unintended consequence: By allowing ships to continue burning cheaper HSFO, ships will not reduce speed and therefore emissions => Scrubbers will delay the uptake of less carbon neutral/zero carbon fuel.
- Demand for HSFO from scrubber-fitted ships stabilizes after 2022.
- First-movers were cruise and passenger vessels.

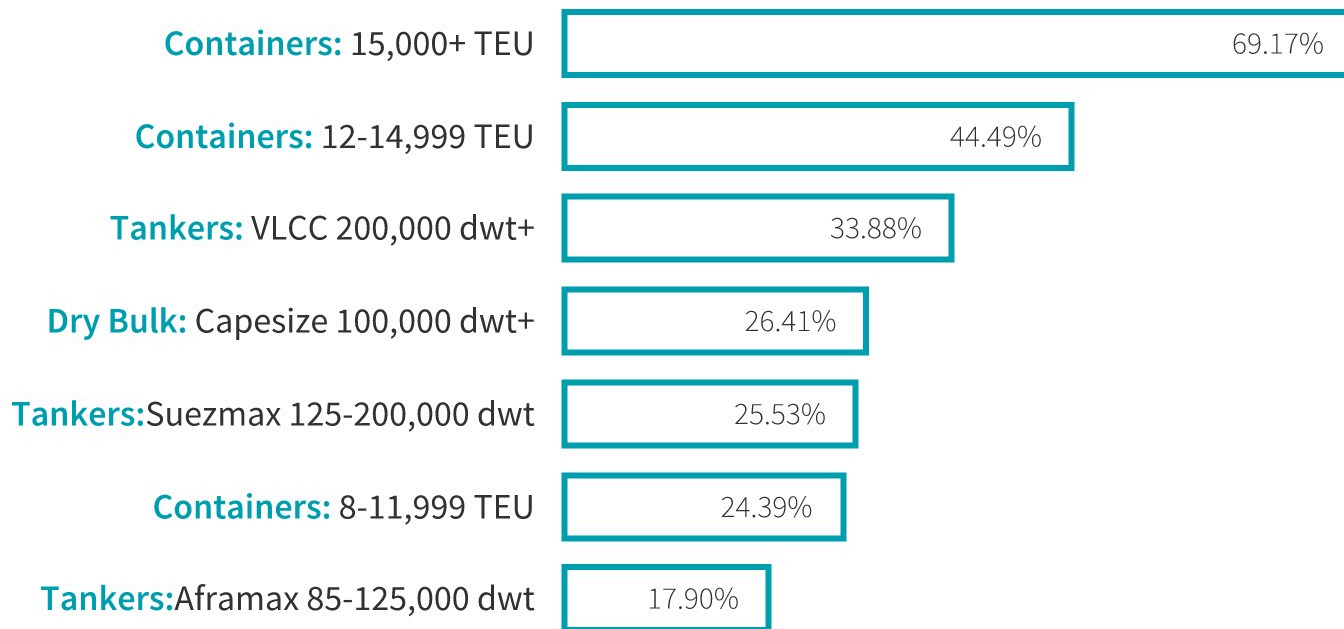
Scrubber orders by vessel type - August 2019

Around 3,000 ships already equipped with scrubbers



Scrubber penetration by segment (in % of total number of vessels)

Highest penetration in containers & tankers

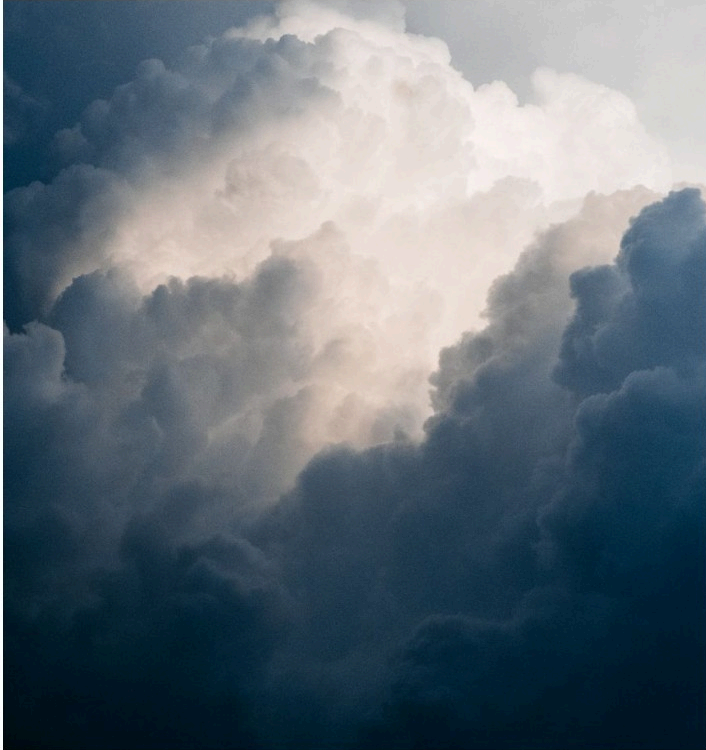


Unanswered questions



- Where will the extra gas oil quantity to meet 2020 market needs come from?
- Is 0,50% sulphur compliant fuel adequately supplied in 2020?
- Is the previously anticipated deficit of compliant fuel with 0.50% Sulphur content confirmed by latest IEA projections?
- Have refineries invested in enough new capacity to compensate for the anticipated rise in demand for MGO & VLSFO?

Unanswered questions



- Will ships be expected to continue serving global trade while using untested and unsafe fuel?
- Will 0.50% compliant fuels be made available in all major ports of call worldwide for use by sea going ships?
- While fuel suppliers and engine manufacturers are not providing any guarantees, how can the crew possibly be held responsible if something happens?
- **With vague fuel supply prospects, specifications & standards and no real support from the other marine stakeholders, how are shipowners supposed to cope with the practical challenges on their own?**

Thank you!

Dimitrios J. Fafalios

Union of Greek Shipowners



UNION OF GREEK SHIPOWNERS