



How IMO regulations impact the Shipping & Energy markets

Gothenburg, May 16, 2018

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How IMO regulations impact the Shipping & Energy markets

Overview

1. How the Shipping market is affected

2. How the Energy market is affected

3. CO2 emission regulations next

How IMO regulations impact the Shipping & Energy markets

Alternatives for ship owners to meet the IMO 2020 Sulphur Cap

- **Install a scrubber and continue to run on HFO bunker fuel.**
 - Most vessels can retrofit but it takes space.
 - Require strong cash flow to prepare/retrofit a full fleet.
 - Uncertainty and concerns about the system types and quality.

- **Run on compliant fuels such as MGO/MDO or LSF0.**
 - Can be used by most engines but more lubes required to avoid operational issues.
 - Lack of standardization of LSF0's an issue as qualities cannot/ should not be mixed.
 - Availability and price...??

- **LNG/ Dual fuel propulsion.**
 - Environmental and EEDI positive and can reach Tier III performance.
 - High investment cost!
 - Availability still limited and prices more linked to marine fuels prices than the gas market.

- **Phase out/ alternative use of the vessel.**
 - Old, fuel thirsty vessels will lose out...
 - Some will be scrapped, some will experience lower utilization while some may hope for alternative use/life...

In the end, the above mentioned is down to the following;

- Is the compliance of the IMO 2020 Sulphur cap a responsibility for the ship owners or the refinery industry?

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What are the ship owners saying about the topic?

➤ **We met 93 different tanker owners in 2017...**

- Here are some of the thoughts shared with us;
 - *"IMO 2020 will be postponed like the BWTS implementation, since it will be impossible to implement".*
 - *"This is a responsibility for the refinery industry, not the ship owners".*
 - *"Scrubbers are too expensive, especially given the weak market and cash flow currently".*
 - *"The BWT systems have not worked properly and it will be the same with scrubbers".*
 - *"Scrubbers already fitted show signs of being worn out already after 5-8 years".*
 - *"What do we do about the sludge? Ports are for sure coming up with waste disposal fees".*
 - *"Closed loop systems impossible on deep-sea vessels".*
 - *"Open loop systems are already talked about as becoming banned".*
 - *"Hybrid systems are too expensive".*
 - *"Scrubber prices are coming off and the technology is still not fully proven so I will wait".*
 - *"The vast majority of the fleet will not have a scrubber so we will be United in pushing a fuel cost increase on to the charterer".*
 - *"It will be impossible to find HFO when few wants it".*

➤ **We have also met around 40 different tanker owners year-to-date...**

- The majority have the same thoughts still, but several have become more positive to the thought of investing in a scrubber....probably after seeing the action several charterers have taken.....?

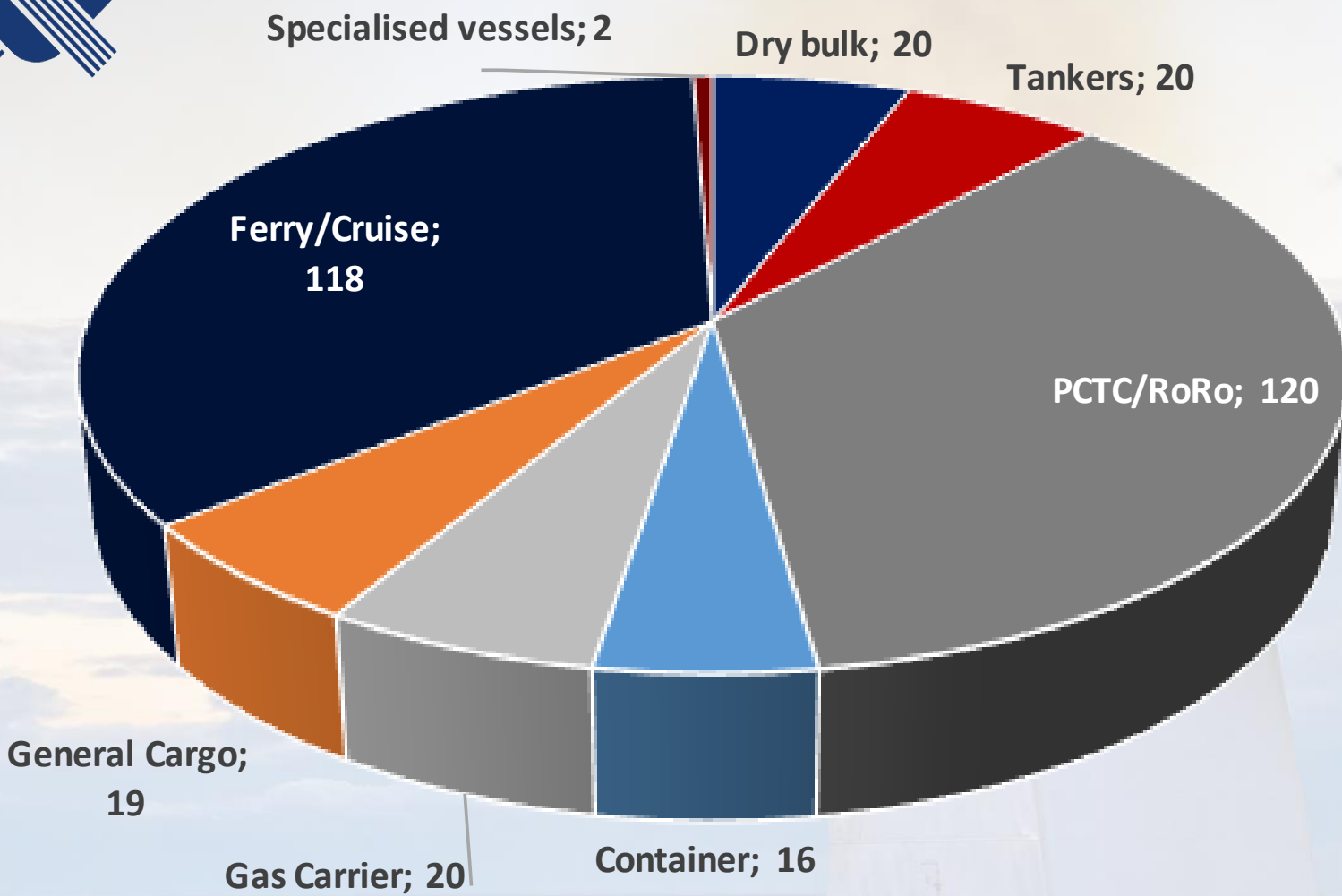
➤ **Even though the sentiment has changed somewhat the past months, the vast majority of the tanker fleet will depend on compliant fuels.**

- Those opting for scrubbers will mainly do that on newbuildings due to the lower installation cost.

➤ **Overall, we find that the owners feel the 2020 responsibility is on the refinery industry.**

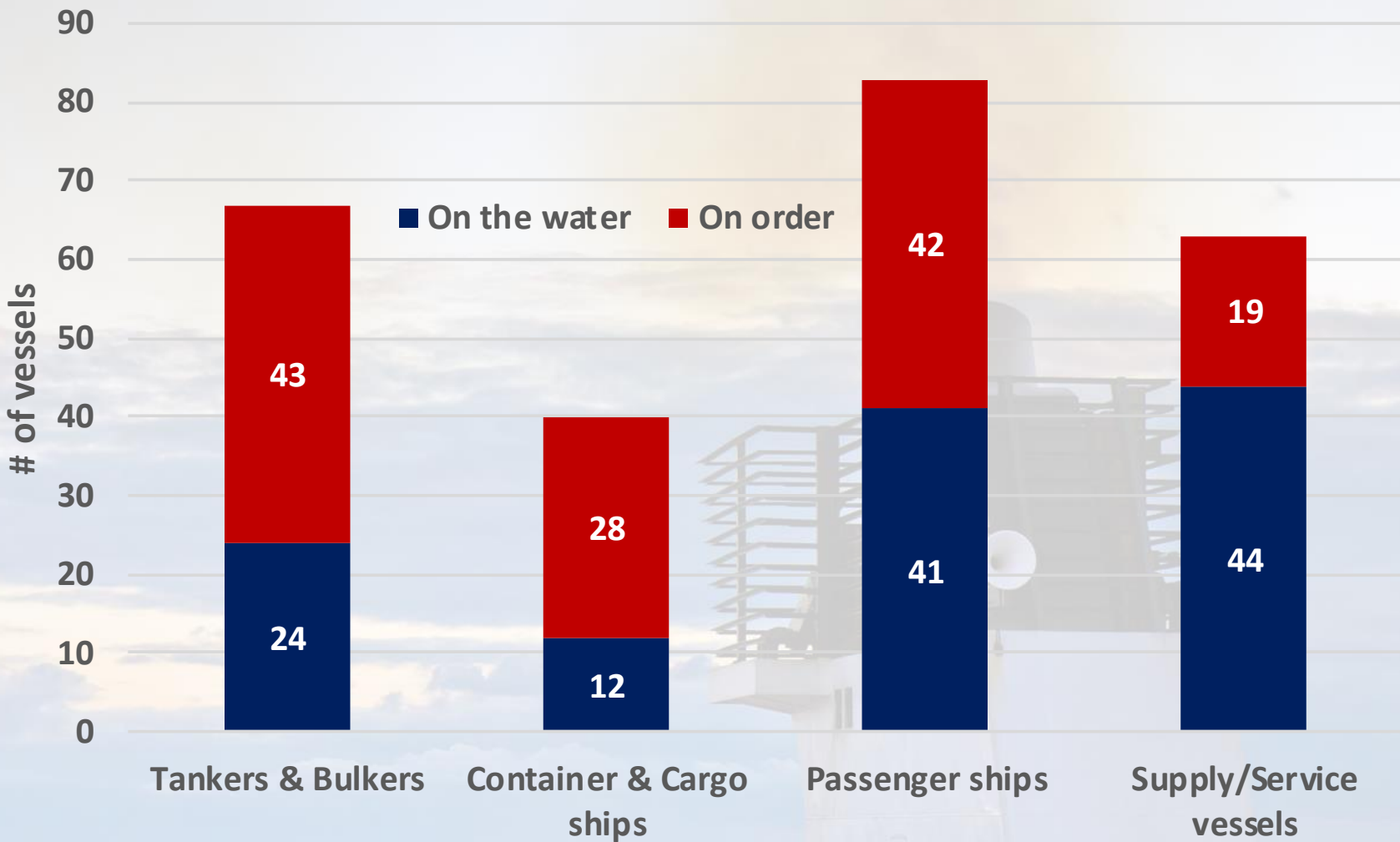
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Vessels on the water with a scrubber installed, as of April 2018. (334 in total, of a fleet of 70,000 merchant ships....)



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Existing & on order vessels with LNG propulsion, as of April 2018. (121/132 in total)



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What are the charterers saying, directly or indirectly?

- **Several significant Oil & Gas majors and Traders have been in the market to secure scrubber fitted vessels for Time-Charter or ordered newbuildings on their own book the past 12 months.**
 - Some in open tenders, others in direct approach to the owners.
 - The list of names that either have been officially or rumoured in the market for scrubber fitted vessels include BP, Koch, Trafigura, Total, Shell, S-Oil, Vitol, Cargill, SK Energy, some of which are major suppliers of Gasoil today...
- **Their reason for securing scrubber fitted vessels may be based on;**
 - They, as industry insiders/ fuel suppliers or traders, know that compliant fuels availability will be limited and fuel prices high...
...And/or...
 - They fear that a united front from the owners will attempt to push a fuel price increase on to the charterers.

Trafigura joins rival traders in selecting scrubbers

Vast tanker orderbook will be fitted with scrubbers, Trafigura has confirmed.

March 27th, 2018 14:13 GMT
by **Andy Pierce**
Published in **TANKERS**

TradeWinds
The Global Shipping News Source

Trafigura has joined the stable of commodity traders opting for scrubbers on new ships to meet new emissions legislation.

Trafigura joins peers including Cargill and Vitol in throwing its weight behind the technology, which has posed as many questions as answers for many shipowners.

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Industry expert thoughts...



IEA warns of 'disruption' due to 2020 low-sulphur shipping rule

The 2020 sulphur cap is forcing owners to decide between low-sulphur fuels, scrubbers and LNG propulsion. As the first seems to dominate interest, the International Energy Agency is adding to the chorus of voices warning of a rocky transition amid oil refinery unpreparedness



Sulphur cap could drive up global bunker fuel costs by \$60bn a year

Consultancy Wood Mackenzie also expects a shift in bunkering locations based on compliant fuels availability, with Singapore potentially losing some business to China



Majority of owners plan to use low-sulphur fuel

Shipowners appear to be taking the path of least resistance by planning to use low-sulphur distillates for their existing fleets in order to meet new IMO sulphur limits from 2020. But they remain concerned about the availability of fuel and are seeking further clarity from IMO over compliance.



IMO Presses On with Enforcement of 2020 Sulfur Cap



Image Courtesy: IMO

The International Maritime Organization (IMO) is standing its ground on the enforcement of the 2020 sulfur cap, which means that as of January 1, 2020, ships will be banned from burning any marine fuel with a sulfur content above 0.5 pct.

Namely, IMO's Sub-Committee on Pollution Prevention and Response (PPR), which met on 5-9 February in London, agreed on draft amendments to the MARPOL Convention on the prevention of pollution from ships (MARPOL Annex VI) to prohibit the carriage of non-compliant fuel oil.

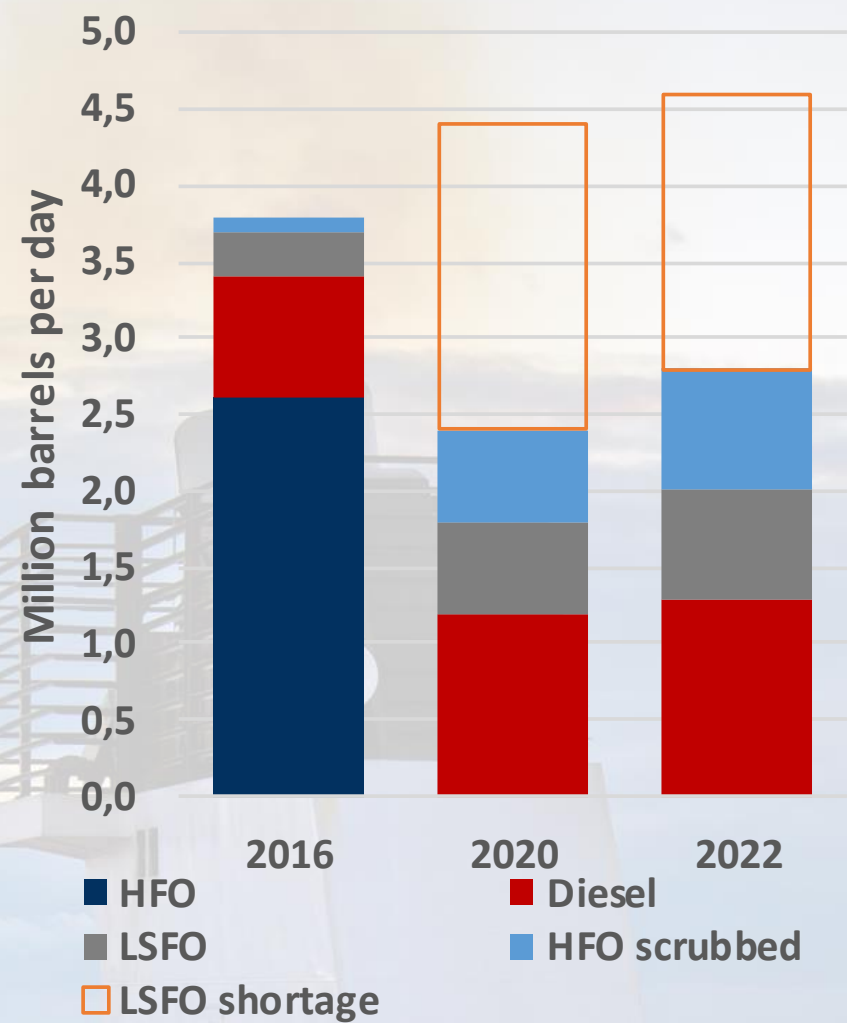
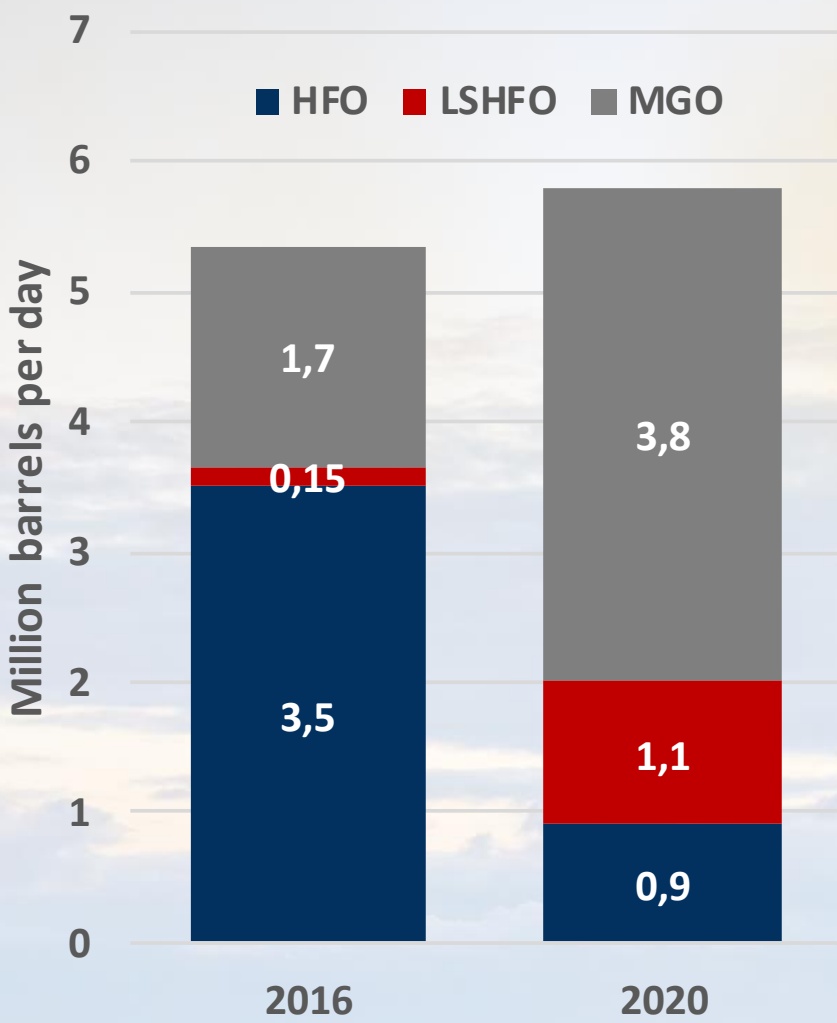


IBIA: 2020 decision on fuel sulfur cap overly optimistic

NOVEMBER 8, 2016 — IMO's decision to impose a global 0.50% marine fuel sulfur limit from 2020 may be based on an overly optimistic initial availability forecast says the International Bunker Industry Association (IBIA) in a commentary released yesterday.

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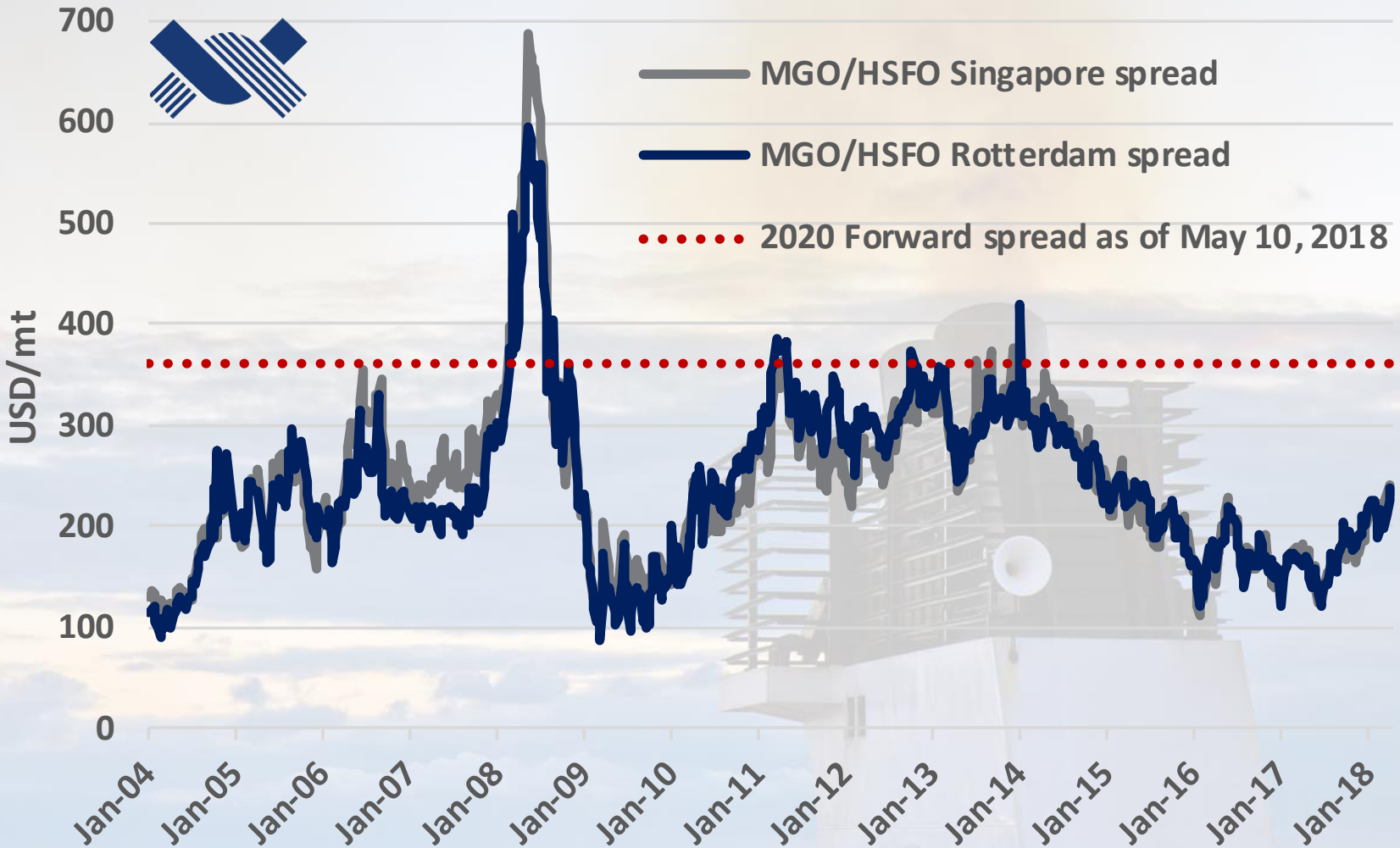
DNV GL & the International Energy Agency on marine fuels demand



Sources: DNV GL, IEA

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What is the fuel price spread suggesting?



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What are the numbers saying, basis the 2020 forward prices as of May 10, 2018?

- We have in the below run the numbers using two existing vessels built by the same yard...
- ...simulated achieving the same WS on the same route (basis 2018 details for Ras Tanura-Ulsan).
 - The two to the left show the vessels basis 2020 forward prices for HFO and the use of a scrubber.
 - The two to the right show the same vessels but using MGO instead of a scrubber.
 - The variation in achieved TCE on the same WS is huge, and would be even bigger to the thirstiest vessels around.

2020 HFO with Scrubber basis Cal20 HFO price Europe per May 10, 2018

Eco Korean, 2017 bit VLCC				Non-Eco Korean, 2010 bit VLCC			
Ras Tanura - Ulsan				Ras Tanura - Ulsan			
WS	39,5			WS	39,5		
Bunker price	267,0	USD/mt		Bunker price	267,0	USD/mt	
Cargo/t	270 000			Cargo/t	270 000		
Flat rate	16,00			Flat rate	16,00		
Variable	0,00			Variable	0,00		
Port cost, load	75 000	USD		Port cost, load	75 000	USD	
Port cost, discharge	75 000	USD		Port cost, discharge	75 000	USD	
Commission	3,75 %			Commission	3,75 %		
Fuel consumption, laden	52,0	Mt/Day		Fuel consumption, laden	77,0	Mt/Day	
Fuel consumption, ballast	31,7	Mt/Day		Fuel consumption, ballast	59,0	Mt/Day	
Distance, laden	6 255	Nm		Distance, laden	6 255	Nm	
Distance, ballast	6 255	Nm		Distance, ballast	6 255	Nm	
Sea margin	5,0 %			Sea margin	5,0 %		
Speed, laden	13,5	Knots		Speed, laden	13,5	Knots	
Speed, ballast	13,0	Knots		Speed, ballast	13,0	Knots	
Sailing time, laden	20,3	Days		Sailing time, laden	20,3	Days	
Sailing time, ballast	21,1	Days		Sailing time, ballast	21,1	Days	
RV	45,3	Days		RV	45,3	Days	
Fuel penalty	3 %			Fuel penalty	3 %		
Brent/Bunker Fuel ratio	4,0			Brent/Bunker Fuel ratio	4,0		
Brent price 2020 contract	66,92	USD/bbl		Brent price 2020 contract	66,92	USD/bbl	
Idle	4,0	Days		Idle	4,0	Days	
Not pumping	2,0	Days		Not pumping	2,0	Days	
Pumping	200			Pumping	200		
TCE	21 260	USD/Day		TCE	14 700	USD/Day	
Tons bunker for RV	1 773	Tons		Tons bunker for RV	2 887	Tons	
Bunker fuel cost	10 445	USD/Day		Bunker fuel cost	17 008	USD/Day	
Steaming days	255	Days		Steaming days	255	Days	
Voyages per year	5,6			Voyages per year	5,6		
Scrubber investment, NB	2,6	USD Mill		Scrubber investment, Retrofit	5,0	USD Mill	
Scrubber investment, Retrofit	5,0	USD Mill		Scrubber payback, Retrofit	0,9	Years	
Scrubber payback, NB	0,7	Years					
Scrubber payback, Retrofit	1,4	Years					

2020 MGO basis Cal20 MGO price Europe per May 10, 2018

Eco Korean, 2017 bit VLCC				Non-Eco Korean, 2010 bit VLCC			
Ras Tanura - Ulsan				Ras Tanura - Ulsan			
WS	39,5			WS	39,5		
Bunker price	627,2	USD/mt		Bunker price	627,2	USD/mt	
Cargo/t	270 000			Cargo/t	270 000		
Flat rate	16,00			Flat rate	16,00		
Variable	0,00			Variable	0,00		
Port cost, load	75 000	USD		Port cost, load	75 000	USD	
Port cost, discharge	75 000	USD		Port cost, discharge	75 000	USD	
Commission	3,75 %			Commission	3,75 %		
Fuel consumption, laden	52,0	Mt/Day		Fuel consumption, laden	77,0	Mt/Day	
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Speed, laden	13,5	Knots		Speed, laden	13,5	Knots	
Speed, ballast	13,0	Knots		Speed, ballast	13,0	Knots	
Sailing time, laden	20,3	Days		Sailing time, laden	20,3	Days	
Sailing time, ballast	21,1	Days		Sailing time, ballast	21,1	Days	
RV	45,3	Days		RV	45,3	Days	
Fuel penalty	-3 %			Fuel penalty	-3 %		
MGO/HFO spread	2,3			MGO/HFO spread	2,3		
MGO/Brent spread	9,4			MGO/Brent spread	9,4		
Idle	4,0	Days		Idle	4,0	Days	
Not pumping	2,0	Days		Not pumping	2,0	Days	
Pumping	200			Pumping	200		
TCE	6 940	USD/Day		TCE	-7 570	USD/Day	
Tons bunker for RV	1 670	Tons		Tons bunker for RV	2 719	Tons	
Bunker fuel cost	23 107	USD/Day		Bunker fuel cost	37 625	USD/Day	

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3. CO2 emission regulations next

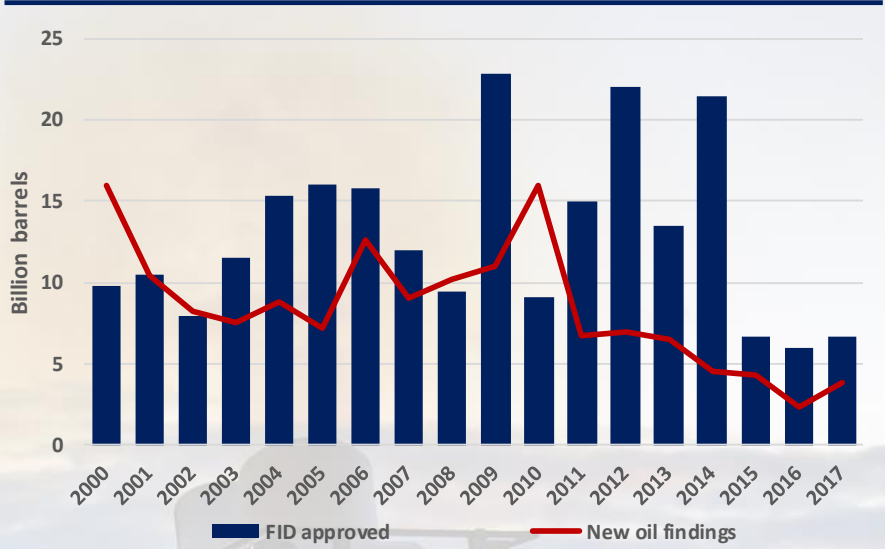


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What about crude oil prices, the basis for fuel prices?

- **A lack of Final Investment Decisions the past 4 years is likely to cause few conventional production start-ups from 2020.**
 - Much of the strong oil demand growth therefore depending on being covered by U.S. shale oil, as a reversal in production by OPEC and its capacity is likely to be fully absorbed by end-2019 at the latest.
 - The comparison of new production needed versus the new production expected added in the illustration below suggest that oil prices are likely to rally above \$100/bll no later than 2020.
 - This should add to the compliant fuels refinery capacity as a worry.

Barrels found & FID'd, by year



Time	2018	2019	2020	2021
Depletion	3.0 mbpd	6.0 mbpd	9.0 mbpd	12.0 mbpd
Consumption growth	1.5 mbpd	2.7 mbpd	4.0 mbpd	5.2 mbpd
New production needed	4.5 mbpd	8.7 mbpd	13.0 mbpd	17.2 mbpd
Conventional start-ups	2.9 mbpd	5.5 mbpd	6.4 mbpd	7.2 mbpd
IEA forecast for shale oil	1.3 mbpd	2.2 mbpd	2.5 mbpd	2.7 mbpd
New production provided	4.2 mbpd	7.7 mbpd	8.9 mbpd	9.9 mbpd
Gap to be filled by drilling tech, stocks, spare capacity	0.3 mbpd	1.0 mbpd	4.1 mbpd	7.3 mbpd

All scenario numbers are accumulated

OPEC spare capacity is currently ~2.1 mbpd

Non-OPEC to provide net 4.65 mbpd, OPEC NGL providing net 320 kbpd

OECD commercial inventory glut to 5-year avg can cover ~200 kbpd for 1 year...

Sources: IEA, Fearnleys

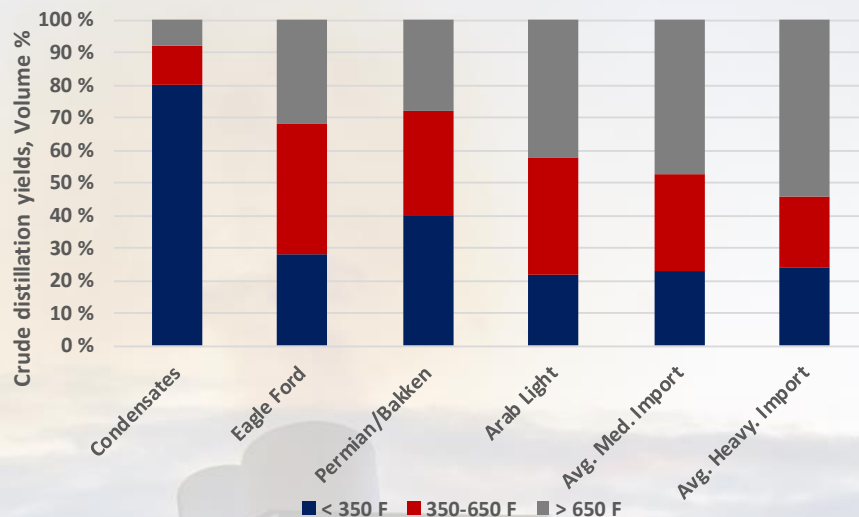
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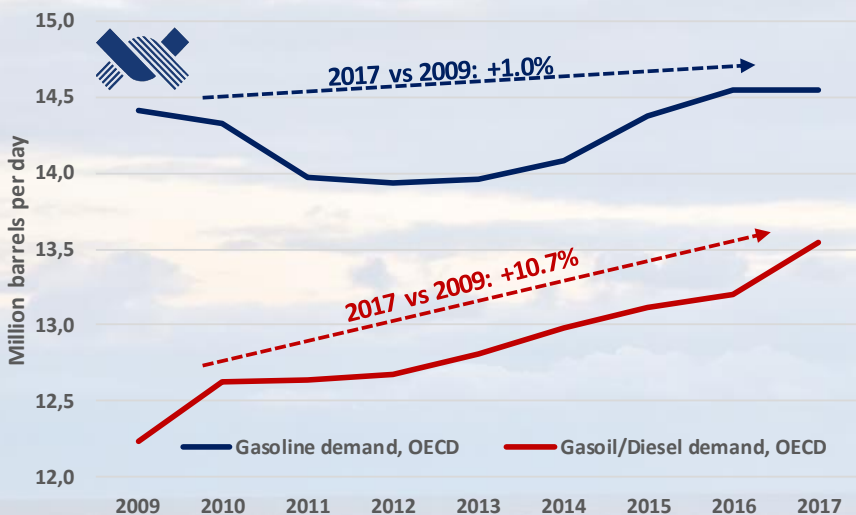
➤ Shale oil is not the solution to everything...

- The refinery industry depend on heavier crudes for blending of the very light shale oil but heavy grade volumes are not growing.
- Shale oil and condensates from U.S. shale are initially rich on gasoline and naphtha, but it is diesel that is in demand – which will be reinforced by shipping’s change of fuel from 2020.
- An alternative for the refineries is to use non-optimized crude (more LTO), but they would then need to give up output and depend on strong margins.

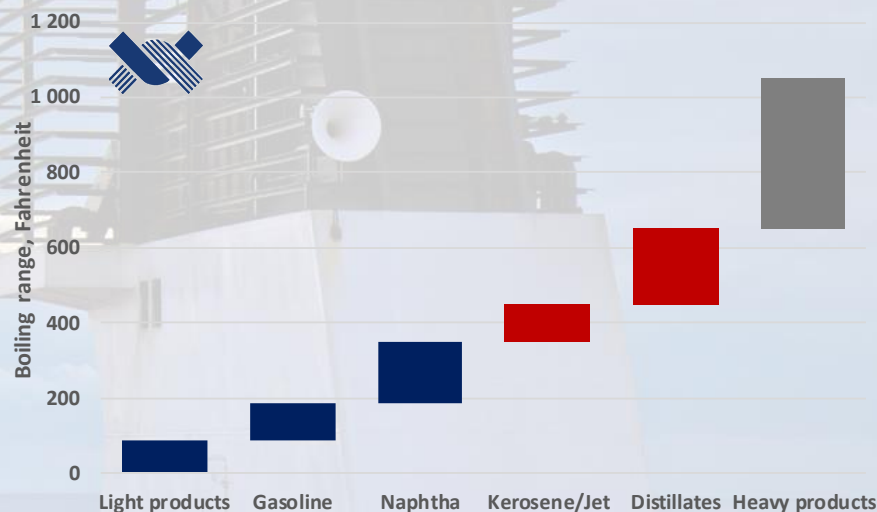
U.S. LTO grades initially rich on gasoline



OECD gasoline vs diesel demand since 2009

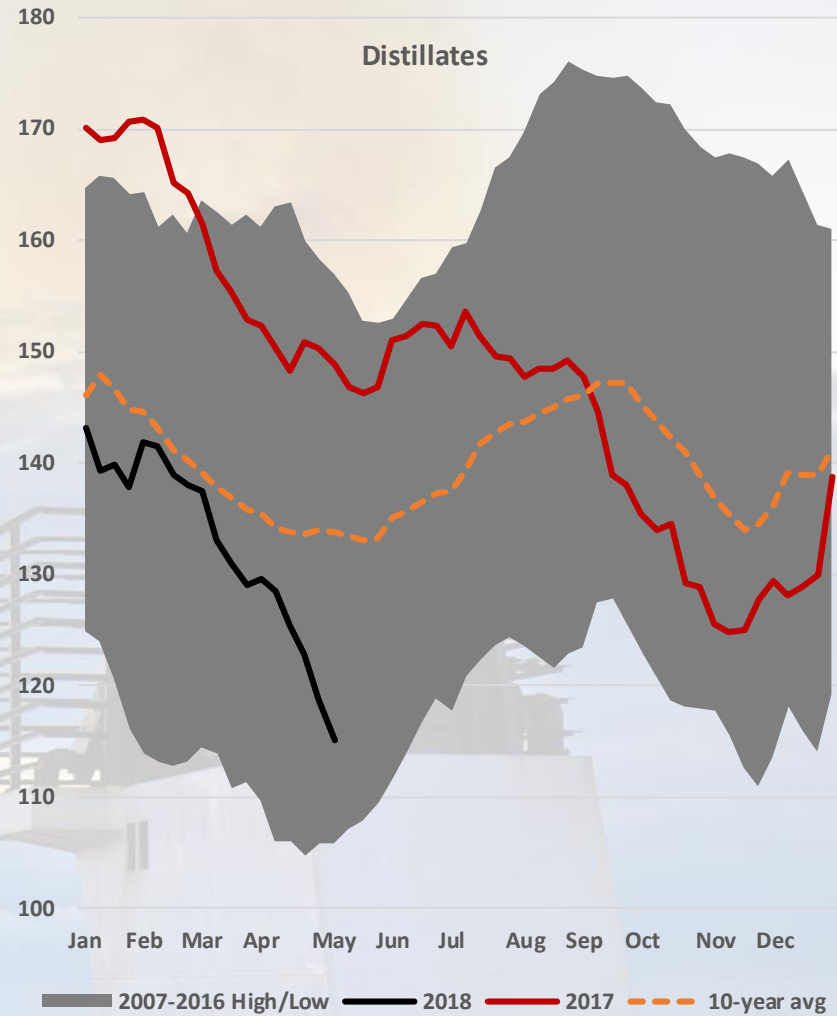
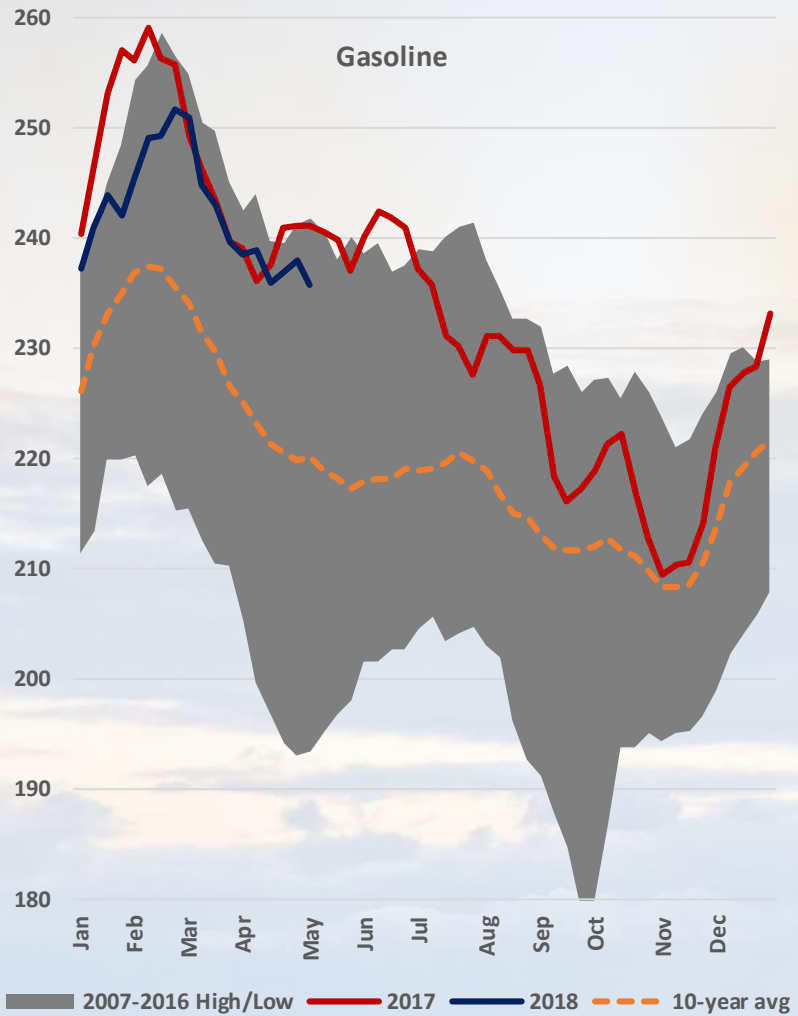


U.S. LTO grades initially rich on gasoline



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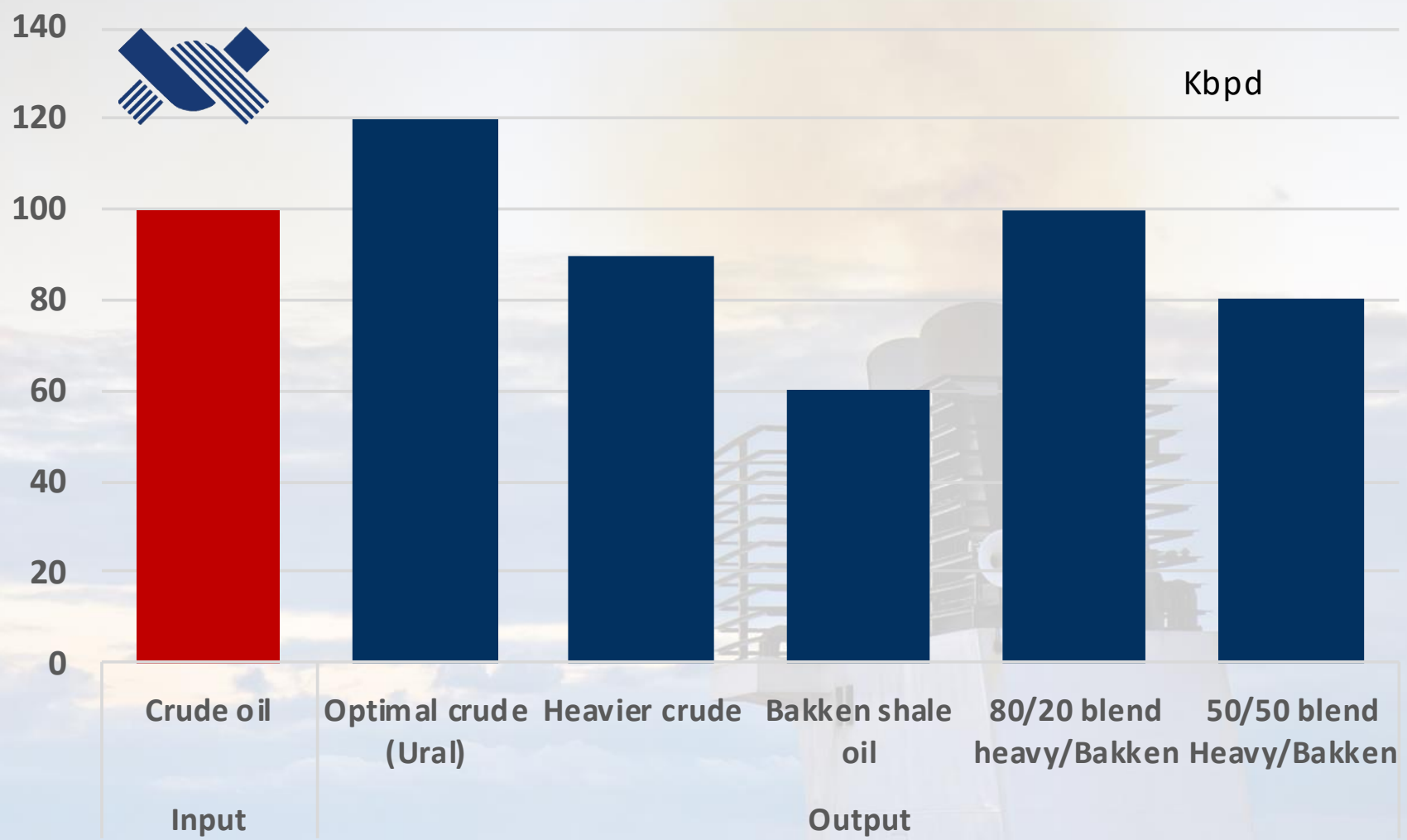
The evidence may already be here....U.S. stocks of gasoline and distillates....import/export and refinery throughput data would have suggested a different status....



Sources: EIA

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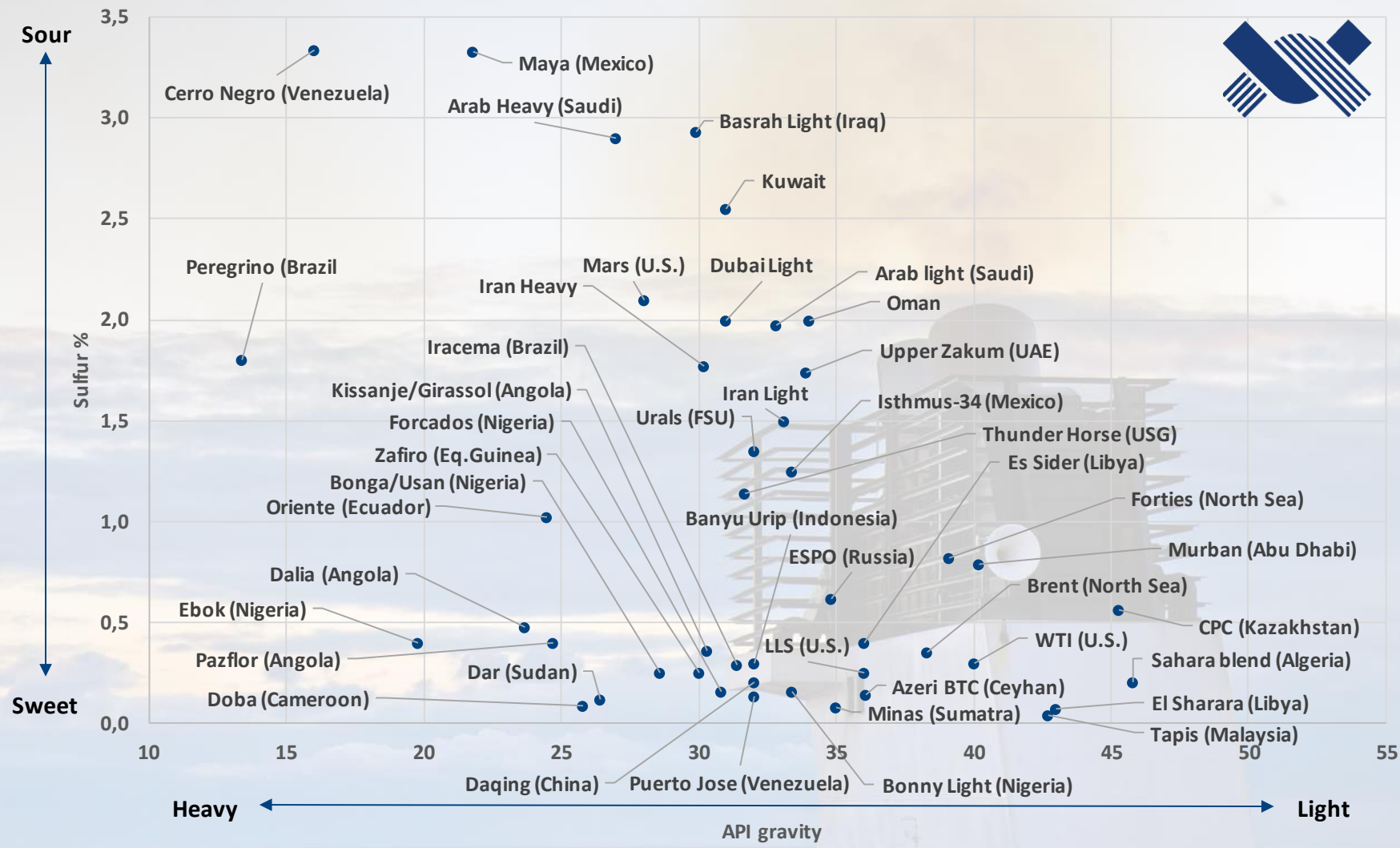
The importance of the right crude oil quality for a refinery...



Sources: A specific European refinery...

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The importance of the right crude oil quality for a refinery...



Sources: Various Oil & Gas companies, EIA, IEA, OPEC

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How IMO regulations impact the Shipping & Energy markets

High compliant oil based fuel prices, and the next IMO regulations on CO2 emissions may speed up the adoption of alternative fuels/energies...

IMO reaches historic CO2 reduction deal

Shipping must cut carbon emissions by 50% by 2050 and improve efficiency

April 13th, 2018 15:33 GMT
by **Adam Corbett**
Published in **CASUALTIES**



Regulators have agreed that shipping should target cutting carbon emissions by a minimum of 50% by 2050, compared to 2008 levels, as part of the industry's contribution to the Paris Agreement.

Delegates at the International Maritime Organisation (IMO) also decided there should be a 40% improvement in ship efficiency by 2030, compared to 2008, and a 50-70% improvement by 2050.



Is LNG the Fuel of the Future?

The economic and environmental benefits of LNG-fueled vessels are compelling – and surprisingly affordable.

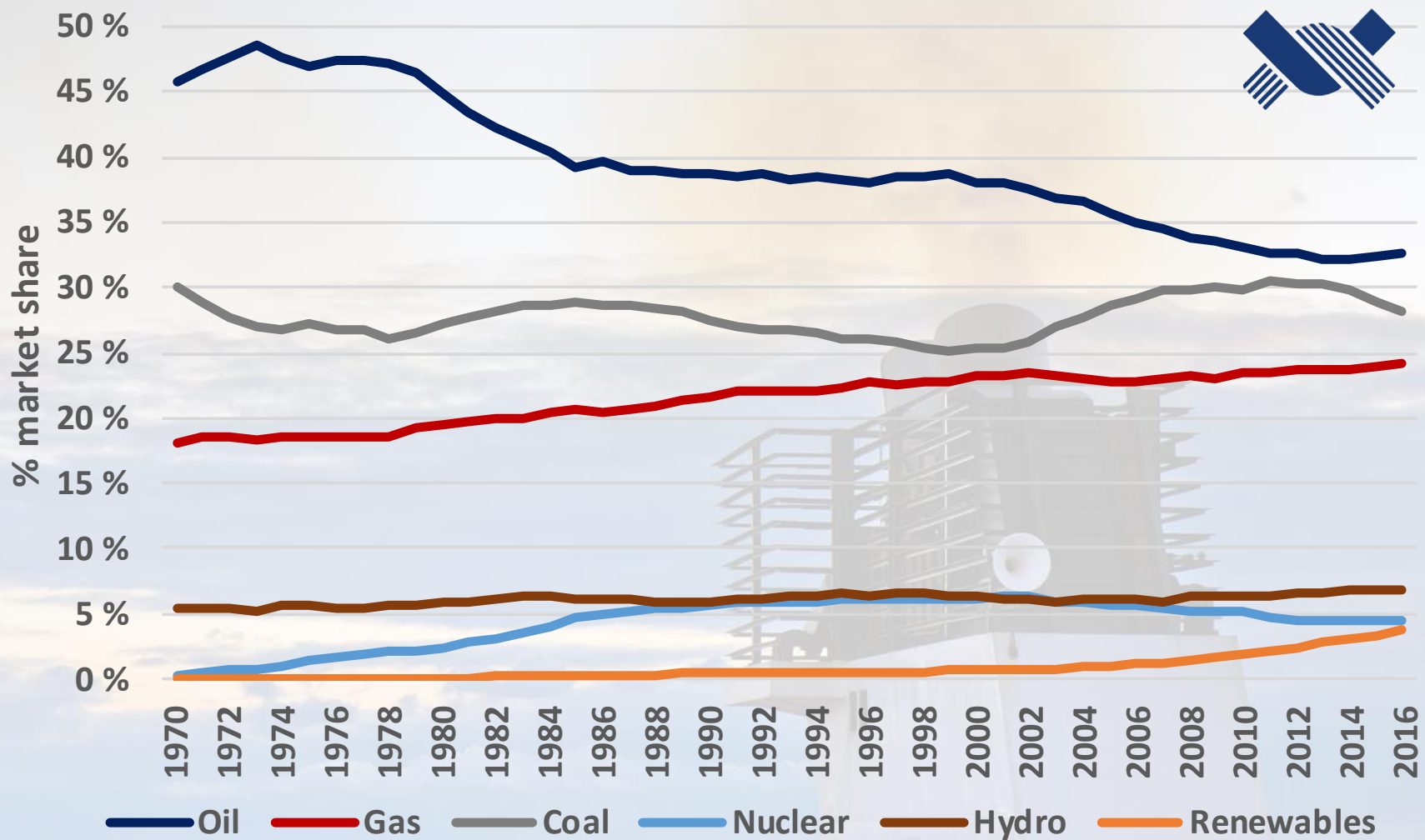
How IMO regulations impact the Shipping & Energy markets

Renewables alternatives are being explored....not all are basis a primary energy source though....



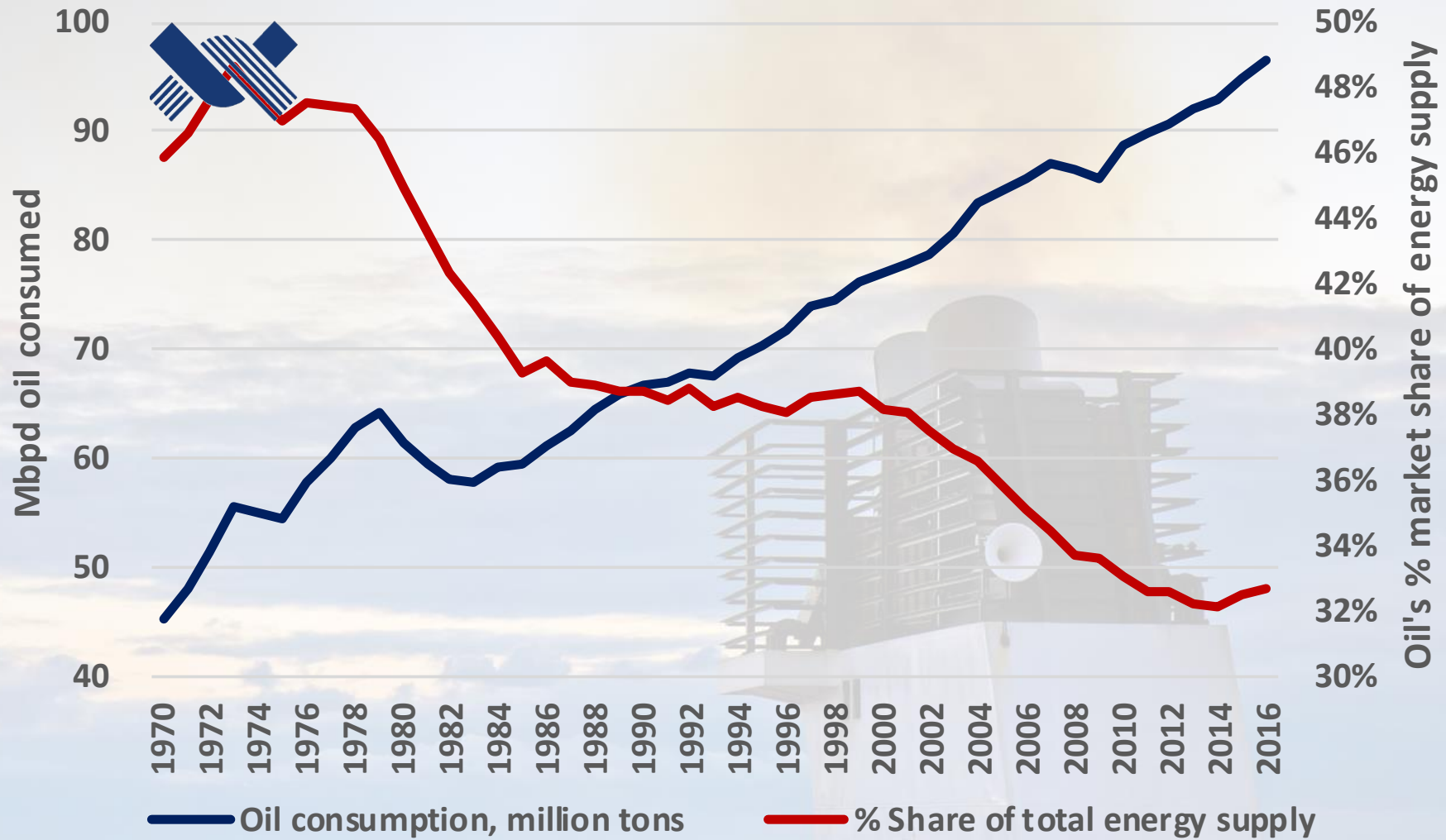
How IMO regulations impact the Shipping & Energy markets

We would expect shipping (and the world) to increasingly adopt LNG as a fuel....followed by even greener alternatives



How IMO regulations impact the Shipping & Energy markets

Further loss of market share for oil may not mean the end of oil consumption in the next decade or two....



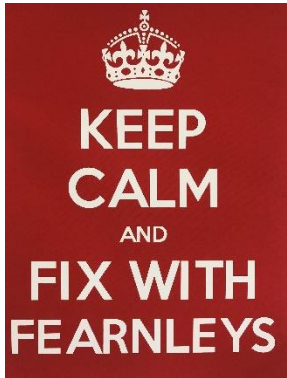
Sources: BP

How IMO regulations impact the Shipping & Energy markets

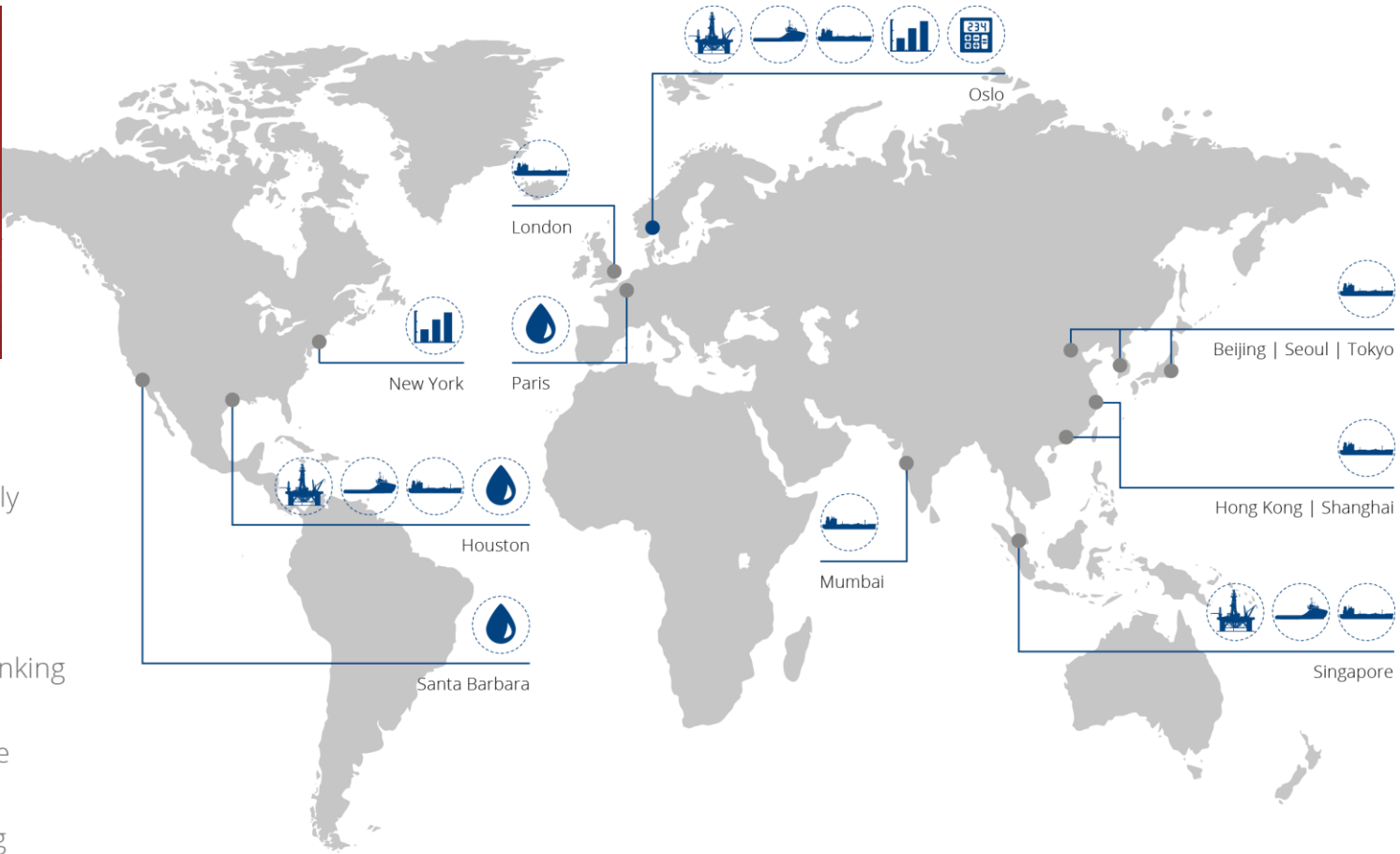
Conclusion

- The IMO 2020 Sulphur Cap largely rely on the refinery industry as the ship owners have done little to prepare and neither see it as their responsibility.
- The refinery industry will most likely not be fully prepared either as lead time was too short, investment requirements big and the right amount of the preferred crude oil qualities may not be available.
- The IMO 2020 Sulphur Cap thereby affect the refinery capacity requested, the preferred crude oil quality, marine fuels prices, and potentially also road fuels prices.
- Charterers in the oil market securing compliant vessels...apparently fearing high compliant fuels prices...
- The IMO CO2 deal is likely to speed up the adoption of LNG as a marine fuel, but also support further development of alternative fuels and energy sources.

Thank you for your attention!



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