



# **An Analysis of the IMO 2020 Sulphur Limit**

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Christophe Barret, Senior Oil Market Analyst

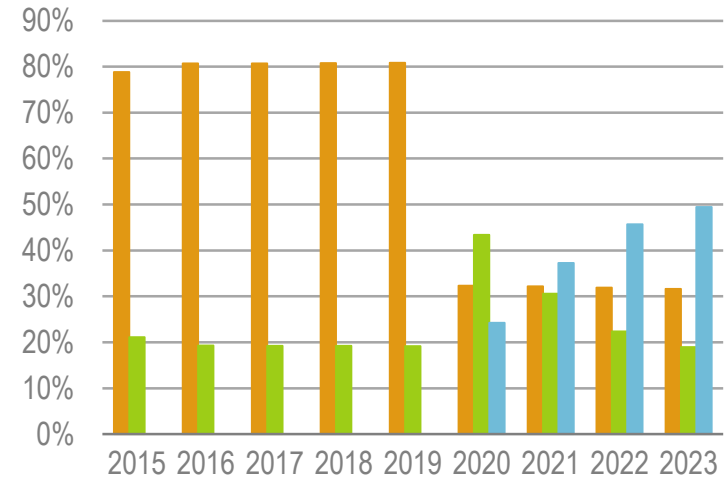
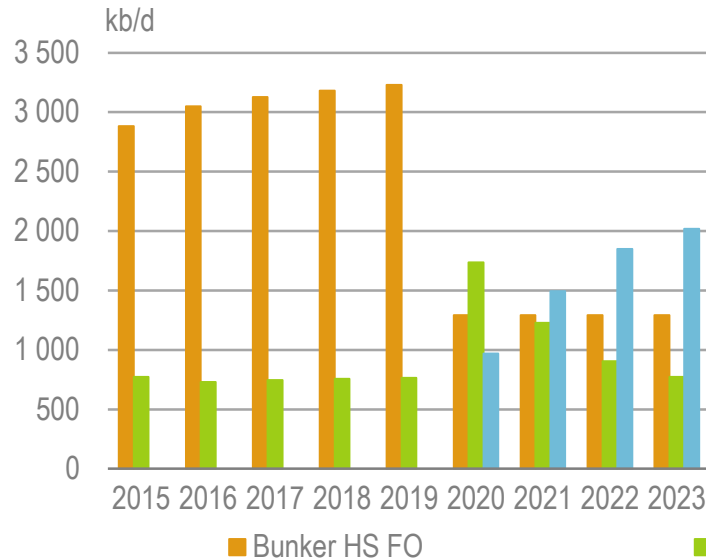
London 23 October 2018

- “*Oil 2018 – Analysis and Forecasts to 2023*” scenario (March 2018)
- New developments in the gasoil market
- Price impact
- Today versus *Oil 2018* scenario

- Need to understand how fuel oil and diesel demand will be impacted by IMO 2020 in order to project future consumption.
- Starting point: lack of low sulfur molecules (marine gasoil or fuel oil) in 2020 will be the main constraint.
- We estimated c. 1 mb/d of diesel (in addition to inland requirements) will be available for marine demand in 2020 from:
  - Refinery capacity developments
  - Crude availability
  - Refinery flexibility (yield shifts)

**\*"Oil 2018 – Analysis and Forecasts to 2023", March 2018. IEA's annual five-year oil market forecast.**

## OECD and major-non-OECD bunker fuel switch by 2020



kb/d	2015	2016	2017	2018	2019	2020	2021	2022	2023
Marine gasoil	773	729	745	756	767	1,736	1,229	905	773
Marine VLSFO	0	0	0	0	0	969	1,496	1,849	2,018
Bunker HS FO	2,883	3,049	3,126	3,180	3,231	1,292	1,292	1,292	1,292
<b>Total</b>	<b>3,656</b>	<b>3,778</b>	<b>3,872</b>	<b>3,937</b>	<b>3,997</b>	<b>3,997</b>	<b>4,017</b>	<b>4,047</b>	<b>4,084</b>
Growth		3.3%	2.5%	1.7%	1.5%	0.0%	0.5%	0.7%	0.9%

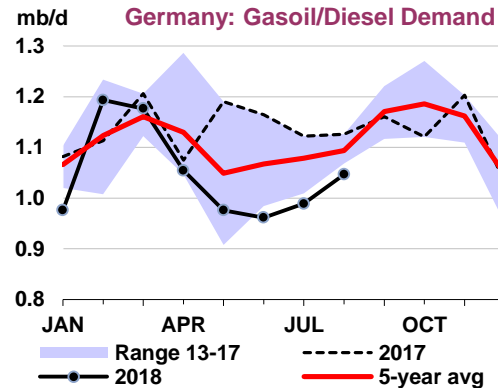
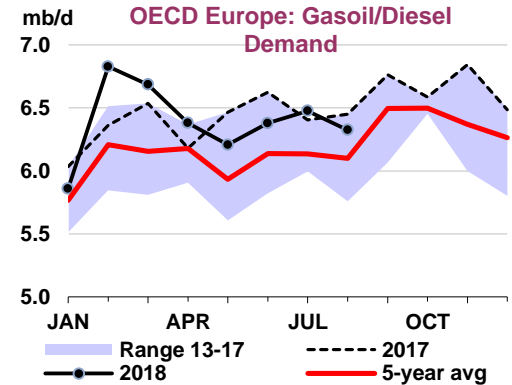
## Comparison vs. 2019 (kb/d)

		2020	2021	2022	2023
A	Drop in HSFO demand	1,939	1,939	1,939	1,939
B	Additional marine gasoil	969	462	139	7
C = D + E + F	<b>New 0.5% Marine fuel</b>	<b>969</b>	<b>1,496</b>	<b>1,849</b>	<b>2,018</b>
D	HSFO blended in new 0.5% fuel	74	179	250	284
E	Gasoil blended in new 0.5% fuel	295	717	999	1,134
F	Very low sulfur fuel oil blended in 0.5% fuel	600	600	600	600
B+E	Total gasoil needed	1,265	1,179	1,138	1,141
A-D	Total HSFO surplus	1,865	1,759	1,689	1,655
= C+ B - A	<b>Total bunker</b>	<b>0</b>	<b>19</b>	<b>49</b>	<b>86</b>

Based on limited additional availability of low sulfur molecules (~1 mb/d gasoil in 2020)

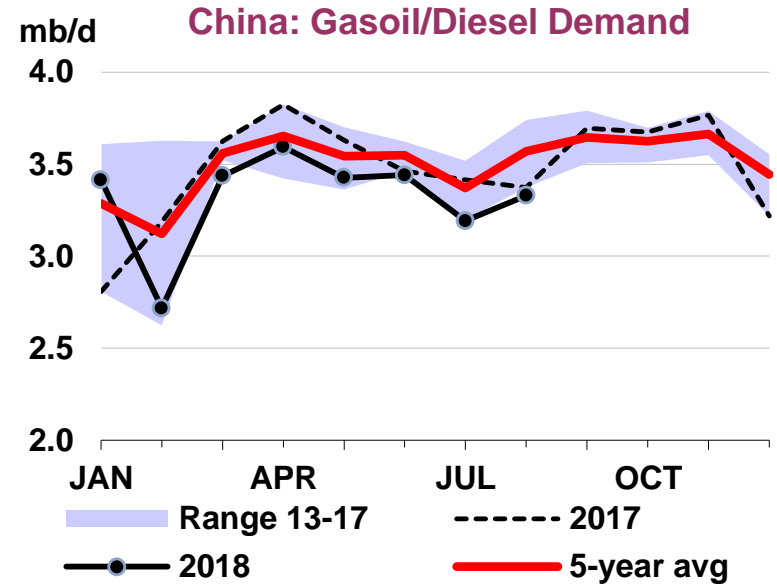
# Changes in diesel demand – Europe’s disaffection

- Slowdown in European gasoil demand
- German share of diesel cars in vehicle sales fell from 41% in 1H17 to 31 % in 1H18.
- The disaffection towards diesel engine cars is spreading all over Europe.
- EU economies are slowing
  - Trade tensions and Brexit
  - Strong deterioration in business sentiment in Germany.



**Diesel demand drop has happened faster than anticipated**

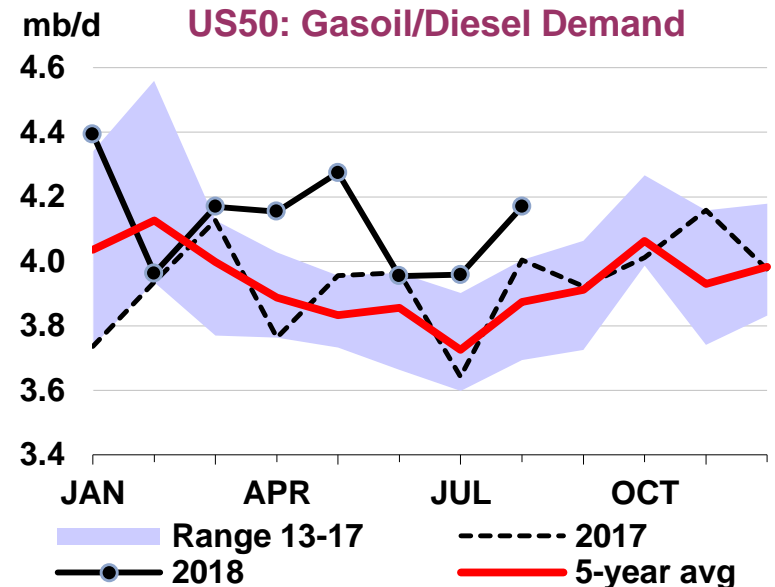
- Urban air quality improvement is a big issue:
  - Sales of electric buses are booming.
  - LNG trucks in Eastern China.
- Industrial upgrade and development of a service-oriented economy.
- Less rail and heavy vehicle freight for coal and industrial output.



**Environmental policies and structural economic change reducing diesel demand in China**

# Changes in diesel demand – strength in the US

- US diesel demand supported by rising imports of goods and strong growth in industrial production.
- Shale oil production pipeline bottlenecks increased reliance on trucks/rail to move crude oil.
- Diesel demand should slow in 2020:
  - Pipeline bottlenecks should ease in 2H19.
  - Trade flows likely to slow.
  - US fiscal expenses likely to slow in 2020.

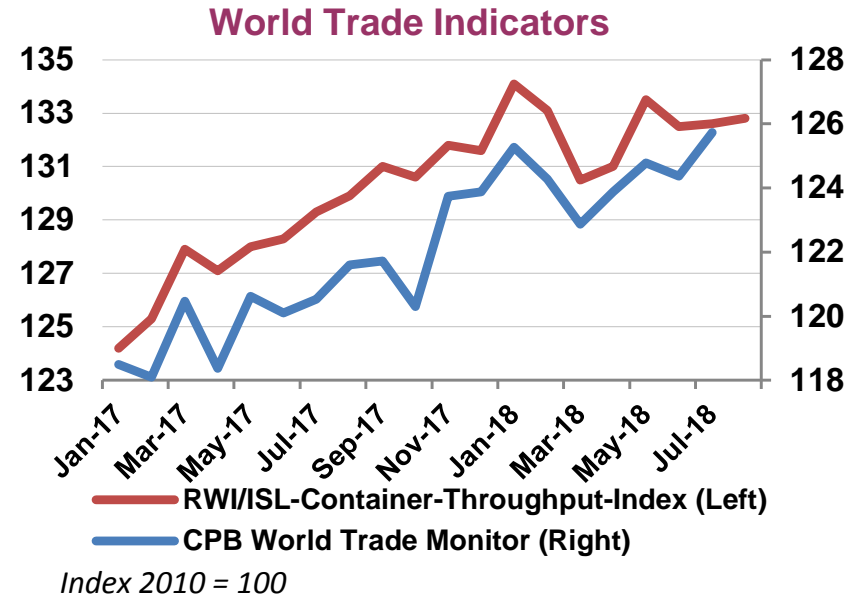


**Diesel demand in the US should slow by 2020**



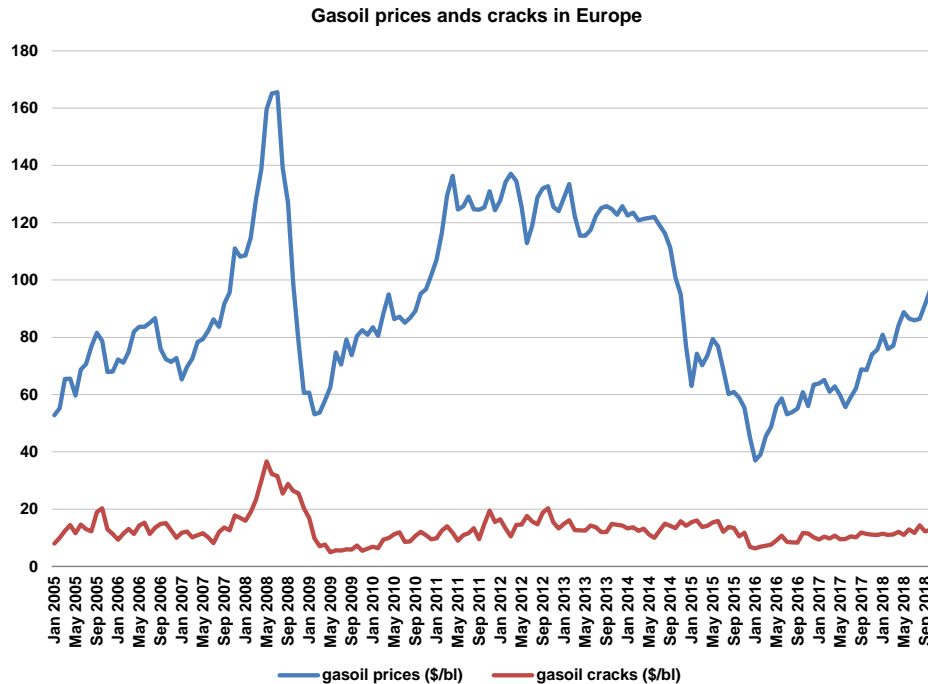
# Changes in diesel demand - slower trade will impact growth

- World trade has already started to slow.
- Slower trade directly impacts MGO and bunker fuel oil demand.
- Road diesel deliveries also correlated with imports.
- IMF scenarios on trade show high risk of economic and trade slowdown.



**Diesel will be particularly impacted by trade disputes**

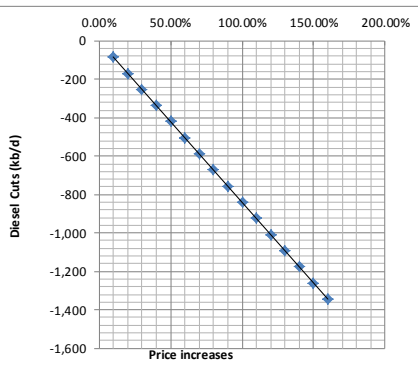
# Price impact - history or elasticity



- With low demand response to prices, diesel prices must significantly increase to cut demand.
- In *Oil 2018* we assumed bunkers would need 200-250 kb/d of diesel from inland demand to achieve the 1.2 mb/d -1.3 mb/d needed for the switch.
- Equivalent to 20% to 30% increase in prices.
- To switch all remaining HSFO to diesel, prices would have to ~double to balance 1 mb/d additional marine gasoil use.

**Diesel prices more than doubled in 2008. Lower spike anticipated in *Oil 2018***

# Possible Price Impact



With Gasoil demand at 28 mb/d and Ep at -0.03

kb/d									
HSFO to switch	3200	3200	3200	3200	3200	3200	3200	3200	3200
VLSFO	1000	1000	1000	1000	1000	1000	1000	1000	1000
Existing fo Is	600	600	600	600	600	600	600	600	600
blend for VLSFO	400	400	400	400	400	400	400	400	400
HSFO in blend	80	80	80	80	80	80	80	80	80
Gasoil in Blend	320	320	320	320	320	320	320	320	320
Scrubbers	200	250	300	350	400	450	500	550	
Compliance	90%	88%	86%	84%	82%	80%	78%	76%	
MGO needed	2000	1886	1772	1658	1544	1430	1316	1202	
Gasoil availability	950	980	1010	1040	1070	1100	1130	1160	
Gasoil Deficit	-1050	-906	-762	-618	-474	-330	-186	-42	
Diesel price increase	125%	108%	91%	74%	56%	39%	22%	5%	

**Price increase needed to rebalance markets depends on scrubbers, compliance and diesel availability**

- Higher oil prices, weaker economic outlook – mean lower demand growth & higher supply e.g. US.
- Slightly more diesel – VLSFO could be available from refining.
- Diesel demand fundamentals have deteriorated.
- Under a scenario similar to that of *Oil 2018* (100% HSFO → 30% VLSFO, 30% MGO, 40% HSFO):
  - Diesel may be less stretched due to lower inland demand growth.
  - Realistic scenario today may be closer to 30% VLSFO, 40% MGO and 30% HSFO.
- Given recent market developments, impact on prices will depend on:
  - Scrubbers installed – some recent acceleration in orders.
  - Logistical constraints
  - Compliance