
Bunker
Holding
Group
BUNKER
HOLDING
AND
MARPOL
2020
IMO
2020

TODAY'S TOPIC - 2020

29	09	45	00
DAYS	HOURS	MINUTES	SECONDS

Bunker Holding Group

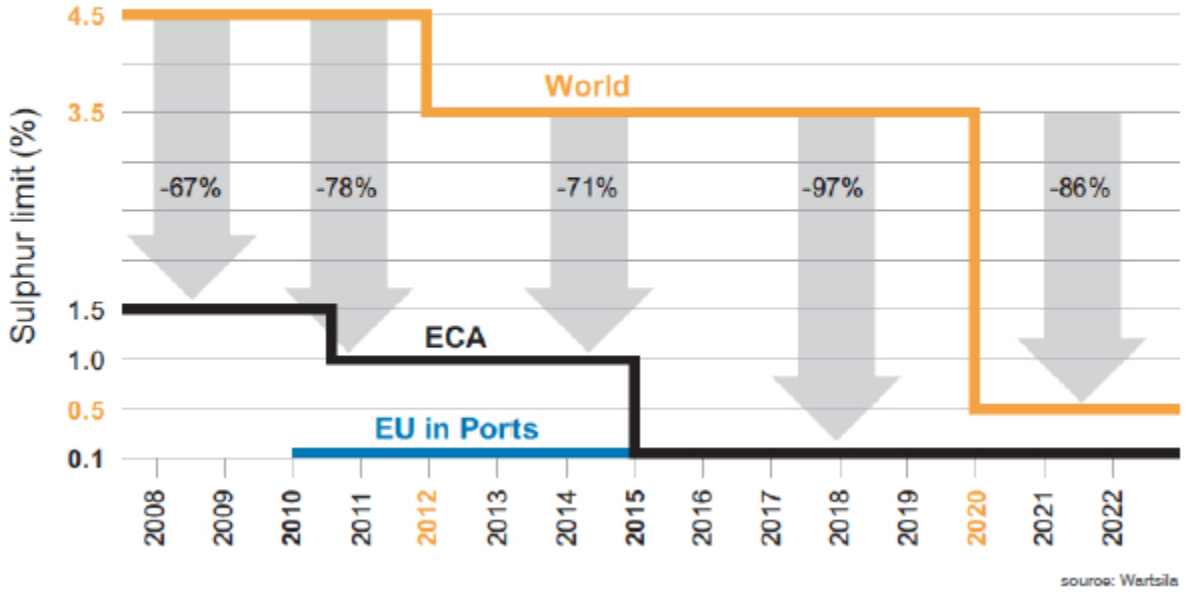
INDUSTRY CONSIDERATIONS

MARPOL 2020

IMO announced a global sulphur cap of 0,5% on Marine Fuels from 1 January 2020

Will be followed by radical changes and significant costs to all players

IMO Marpol Annex VI sulphur limits timeline



source: Wartsila

FORECASTED PRODUCT PORTFOLIO POST 2020

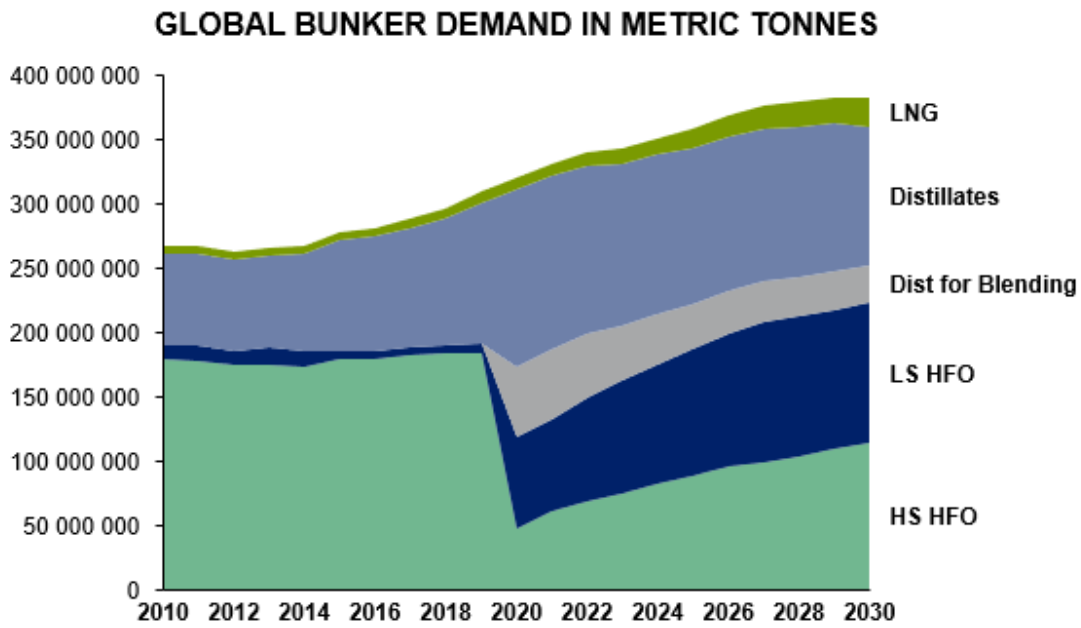
2020 FUEL DEFINITIONS

Ultra Low Sulphur Fuel Oil (**ULSFO**)	max 0.10% sulphur
Very Low Sulphur Fuel Oil (**VLSFO**)	max. 0.50% sulphur
Low Sulphur Fuel Oil (**LSFO**)	max 1.00% sulphur
Low Sulphur Marine Gasoil (**LS MGO)**	max 0.10% sulphur
High Sulphur Marine Gasoil (**HS MGO**)	above 0.10% sulphur
High Sulphur Fuel Oil (**HSFO)**	max 3.50% sulphur
Liquified Natural Gas (**LNG**)	~0% sulphur

OTHER ALTERNATIVE FUELS/RENEWABLES

- **Methanol**
- **Biodiesel**
- **LPG**
- **Nuclear**
- **Wind/Solar**
  Limited uptake of these fuels in the first few years post 2020

- **Non Compliance**
  There is an expectation that some shipowners will not comply. Estimates to be around 6%



Source Platts

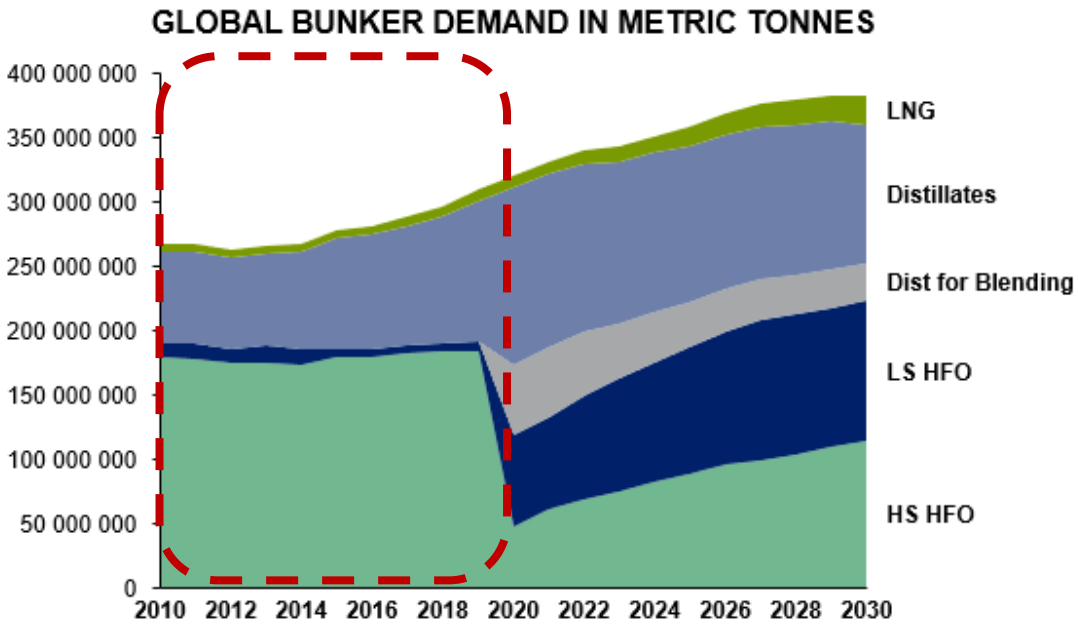
BUNKER INDUSTRY – PRIOR TO & POST 2020

BUNKER INDUSTRY PRIOR 2020

- **Simple** product selection & well **balanced** market
- Relationship mainly based on price (**transactional**)
- **Credit** environment supportive of customers needs
- Crowded **competitor** landscape

BUNKER INDUSTRY 2020 ALREADY IN FULL IMPLEMENTATION

- Price impact (**spreads**) Big swings at major ports
- Managing **multiple grades** (diverse range of Specs within the 0.5% fuels)
- **Quality** renewed interest from shipowners on understanding specifications on product
- Shift from price to service / solution provider relationship with suppliers
- Supply availability less predictable – too many factors to consider.
- From transactional to strategic with focus on reliability and trust (emotional)
- Credit environment – challenging, not as flexible / liquid
- Potential for contracted competitor landscape



Source Platts

WHAT ABOUT PRICING – SPREAD ANALYSIS

Projections based on our analysis –Summer 2018

Price differentials/ spreads ($USD)	2020 6-12 Months	2021	2022	2023	2024
MGO to VLSFO	45 – 80	40 – 70	30 – 60	20 – 30	20 – 30
MGO to HSFO	275 - 380	250 – 350	200 – 300	180-280	<250
VLSFO to HSFO	200 – 240	170 – 185	170 – 185	180 – 200	180 - 200

BW Posted prices 25.11.2019

Port	IFO380	IFO180	MGO	LSMGO	MDO	ULSFO	Barge
Algeciras	(SYM:PUAFA00) 303.00 ▼ -23.00	(SYM:PUACT00) 327.00 ▼ -23.00	(SYM:AARSH00) 639.00 ▲ +2.00	(SYM:AARSH00) 639.00 ▲ +2.00	-	-	F.O.B.
Fujairah	(SYM:PUAXP00) 250.00 ◀ 0.00	(SYM:PUAXQ00) 259.00 ▼ -1.00	(SYM:AARKH00) 670.00 ▼ -5.00	675.00 ▼ -5.00	-	-	F.O.B.
Gibraltar	(SYM:AAKAB00) 303.00 ▼ -23.00	(SYM:AAJZZ00) 327.00 ▼ -23.00	(SYM:AARSU00) 639.00 ▲ +2.00	(SYM:AARSU00) 639.00 ▲ +2.00	-	-	F.O.B.
Houston	(SYM:PUAES00) 364.00 ▲ +7.00	(SYM:PUACE00) 432.00 ▲ +7.00	(SYM:AAWYQ00) 615.00 ▲ +20.00	(SYM:AAWYQ00) 615.00 ▲ +20.00	-	-	$25.00
Rotterdam	(SYM:PUAFN00) 252.00 ▲ +10.00	(SYM:PUADN00) 276.00 ▲ +10.00	(SYM:AARTG00) 557.00 ▲ +2.00	(SYM:AARTG00) 557.00 ▲ +2.00	-	555.00 ▼ -1.33	F.O.B.
Singapore	(SYM:PUAFT00) 299.00 ▲ +5.00	(SYM:PUADW00) 308.00 ▲ +4.00	(SYM:AALMZ00) 578.25 ▲ +4.25	580.00 ◀ 0.00	568.25 ▲ +4.25	-	F.O.B.

Projections based on BH analysis

Forecast price differentials ($USD/mt)	*2020*	*2021*	*2022*	*2023*	*2024*
MGO > VLSFO	**45-80**	40-70	30-60	20-30	20-30
MGO > HSFO	**275-380**	250-350	200-300	180-280	<250
VLSFO > HSFO	**200-240**	170-185	170-185	180-200	180-200

25.11.2019 BW price indications ($USD/mt)	*Fujairah*	*Houston*	*Rotterdam*	*Singapore*	*Gibraltar*
HSFO 3.5	250	364	252	299	303
MGO 0.1	670	615	557	578	639
VLSFO 0.5 (80/20 blend)	586	565	496	522	572

25.11.2019 spreads in numbers ($USD/mt)	*Fujairah*	*Houston*	*Rotterdam*	*Singapore*	*Gibraltar*
MGO > VLSFO	84	50	61	56	67
MGO > HSFO	**420**	**251**	**305**	**279**	**336**
VLSFO > HSFO	336	201	244	223	269

25.11..2019 spreads in percent (%)	*Fujairah*	*Houston*	*Rotterdam*	*Singapore*	*Gibraltar*
MGO > VLSFO	13%	8%	11%	10%	11%
MGO > HSFO	168%	69%	121%	93%	111%
VLSFO > HSFO	134%	55%	97%	75%	89%

Crude Brent Price $ 63.74

Singapore last known indication for VLSFO 25.11.2019 $553.00 ($254.00 premium to HSFO & $25.00 discount to MGO)

Fujairah last known indication for VLSFO 25.11.2019 $570.00 ($320.00 Premium to HSFO & $100.00 discount to MGO)

Bunker Holding Group

WHAT ABOUT PRICING – SPREAD ANALYSIS

Projections based on our analysis –Summer 2018

Price differentials/ spreads ($USD)	2020 6-12 Months	2021	2022	2023	2024
MGO to VLSFO	45 – 80	40 – 70	30 – 60	20 – 30	20 – 30
MGO to HSFO	275 - 380	250 – 350	200 – 300	180-280	<250
VLSFO to HSFO	200 – 240	170 – 185	170 – 185	180 – 200	180 - 200

BW Posted Prices 18.09.19

Port	IFO380	IFO180	MGO	LSMGO	MDO	ULSFO	Barge
Algeciras	(SYM:PUAFA00) 485.00 ▲ +65.00	(SYM:PUACT00) 509.00 ▲ +65.00	(SYM:AARSH00) 690.00 ▲ +19.00	(SYM:AARSH00) 690.00 ▲ +19.00	-	-	F.O.B.
Fujairah	(SYM:PUAXP00) 482.75 ▼ -46.50	(SYM:PUAXQ00) 488.75 ▼ -47.50	(SYM:AARKH00) 690.00 ▼ -33.00	695.00 ▼ -33.00	-	-	F.O.B.
Gibraltar	(SYM:AAKAB00) 485.00 ▲ +65.00	(SYM:AAJZZ00) 509.00 ▲ +65.00	(SYM:AARSU00) 690.00 ▲ +19.00	(SYM:AARSU00) 690.00 ▲ +19.00	-	-	F.O.B.
Houston	(SYM:PUAES00) 480.00 ▼ -15.00	(SYM:PUACE00) 548.00 ▼ -15.00	(SYM:AAWYQ00) 665.00 ▲ +5.00	(SYM:AAWYQ00) 665.00 ▲ +5.00	-	-	$25.00
Rotterdam	(SYM:PUAFN00) 410.00 ▲ +20.00	(SYM:PUADN00) 434.00 ▲ +20.00	(SYM:AARTG00) 615.00 ▲ +5.00	(SYM:AARTG00) 615.00 ▲ +5.00	-	560.00 ▼ -20.00	F.O.B.
Singapore	(SYM:PUAFT00) 535.00 ▼ -60.00	(SYM:PUADW00) 541.00 ▼ -61.00	(SYM:AALMZ00) 611.50 ▼ -30.00	612.00 ▼ -33.00	601.50 ▼ -30.00	-	F.O.B.

Projections based on BH analysis

Forecast price differentials ($USD/mt)	*2020*	*2021*	*2022*	*2023*	*2024*
MGO > VLSFO	45-80	40-70	30-60	20-30	20-30
MGO > HSFO	275-380	250-350	200-300	180-280	<250
VLSFO > HSFO	200-240	170-185	170-185	180-200	180-200

18.09.2019 BW price indications ($USD/mt)	*Fujairah*	*Houston*	*Rotterdam*	*Singapore*	*Gibraltar*
HSFO 3.5	483	480	410	535	485
MGO 0.1	690	665	690	612	690
VLSFO 0.5 (80/20 blend)	649	628	634	597	649

18.09.2019 spreads in numbers ($USD/mt)	*Fujairah*	*Houston*	*Rotterdam*	*Singapore*	*Gibraltar*
MGO > VLSFO	41	37	56	15	41
MGO > HSFO	**207**	**185**	**280**	**77**	**205**
VLSFO > HSFO	166	148	224	62	164

18.09..2019 spreads in percent (%)	*Fujairah*	*Houston*	*Rotterdam*	*Singapore*	*Gibraltar*
MGO > VLSFO	6%	6%	8%	3%	6%
MGO > HSFO	43%	39%	68%	14%	42%
VLSFO > HSFO	34%	31%	55%	12%	34%

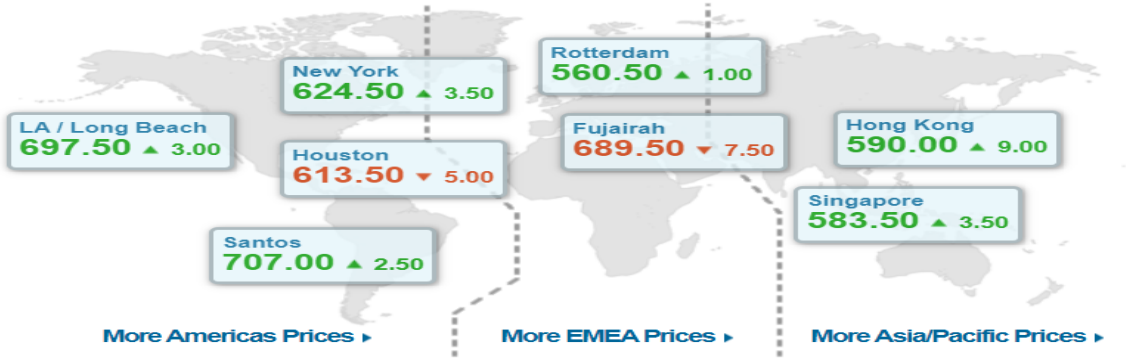
Crude Brent Price $ 63.87 Nov 19

Singapore last known indication for VLSFO 18.09.2019 $610.00 ($75.00 premium to HSFO & $96.00 discount to MGO)

Fujairah last known indication for VLSFO 10.09.2019 $615.00 ($132.00 Premium to HSFO & $75.00 discount to MGO)

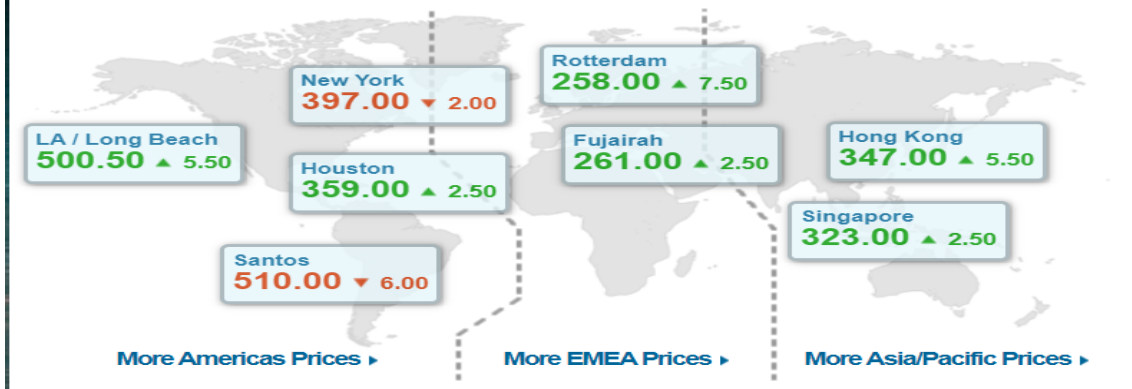
SPREAD ANALYSIS – ACTUAL INDICATIONS

IFO380 | IFO180 | VLSFO | **MGO**



	Price $/mt	Change	High	Low	Spread
Global 20 Ports Average	646.50 ▲	+1.50	646.50	646.50	0.00
Global 4 Ports Average	611.50 ▼	-2.50	611.50	611.50	0.00
Global Average Bunker Price	686.00 ▲	+2.50	686.00	686.00	0.00

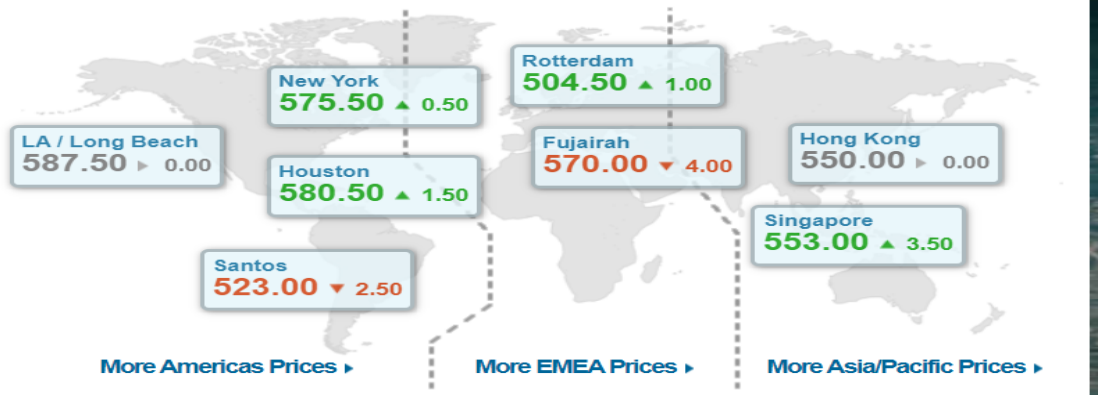
IFO380 | IFO180 | VLSFO | MGO



	Price $/mt	Change	High	Low	Spread
Global 20 Ports Average	331.50 ▲	+3.00	331.50	331.50	0.00
Global 4 Ports Average	300.00 ▲	+3.50	300.00	300.00	0.00
Global Average Bunker Price	368.50 ▲	+2.00	368.50	368.50	0.00

Pricing source: Ship & Bunker

IFO380 | IFO180 | **VLSFO** | MGO



	Price $/mt	Change	High	Low	Spread
Global 20 Ports Average	561.50 ▲	+1.00	561.50	561.50	0.00
Global 4 Ports Average	552.00 ▲	+0.50	552.00	552.00	0.00
Global Average Bunker Price	574.50 ▲	+1.00	574.50	574.50	0.00

Summer 2018 predictions	Differential USD 2020
MGO to VLSFO (-)	**45-80**
MGO to HSFO (-)	**275-380**
VLSFO to HSFO (+)	**200-240**
Spreads based on actual Ind	**Differential USD**
MGO to VLSFO (-)	**112**
MGO to HSFO (-)	**318**
VLSFO to HSFO (+)	**206**

VLSFO PROJECTED BLENDS – CONSIDERATIONS FOR SHIPPING AND SUPPLIERS

POTENTIAL BLEND COMPONENTS - ONLY A SAMPLE OF SOME

- Straight run sweet residue
- Straight run sour residue
- Straight run diesel
- FCC Light-cycle oil
- Treated light cycle oil
- Treated light distillate
- Treated atmospheric gas oil
- Hydro treated gas oil
- H-oil bottoms
- Treated atmospheric residue
- Visbreaker tar
- Hydrotreated kerosene
- Desulfurized jet blend
- Vacuum residue
- Vacuum gas oil
- No 6 fuel oil
- M 100
- Slurry oil
- Shale oils
- Plus more
- *All with individual characteristics as density, sulfur content, viscosity, etc. Depends of crude feeds and refinery configuration.*

HOW TO CATEGORIZE 0.5% FUELS

A - Naphthenic

- High CCAI (relation between viscosity and density - High density, low viscosity).
- Presence of cat fines.
- Can hold more or less stability reserves.

B - Paraffinic

- Low density.
- Very low or no MCR.
- No cat fines.
- High pour point.
- Does not give sense to test stability reserves when no asphaltenes to precipitate.

AB – Straight Run

- Straight Run Fuel oils (and most DMA gas oils).
- Medium density and High MCR.
- High on heavy metals.
- High acid number (weak acids).
- High stability reserves (Low TE).

QUALITY IMPACT

KEY POINTS TO CONSIDER: THE DEMAND SIDE

- Easier to manage if fuel of choice is MGO or HSFO (vessels with scrubbers)
- For VLSFO 0.5% their challenges would be:
  - Preparation to shift from HSFO to VLSFO (timing to take VLSFO and to dispose ROB HSFO after Jan. 1st 2020)
  - Managing fuel change over procedures based on different blend characteristics (Paraffinic vs Naphthenic)
  - Adjustments required for different viscosity, including lube selection
  - Increase the amount of spare parts to minimize operational risks

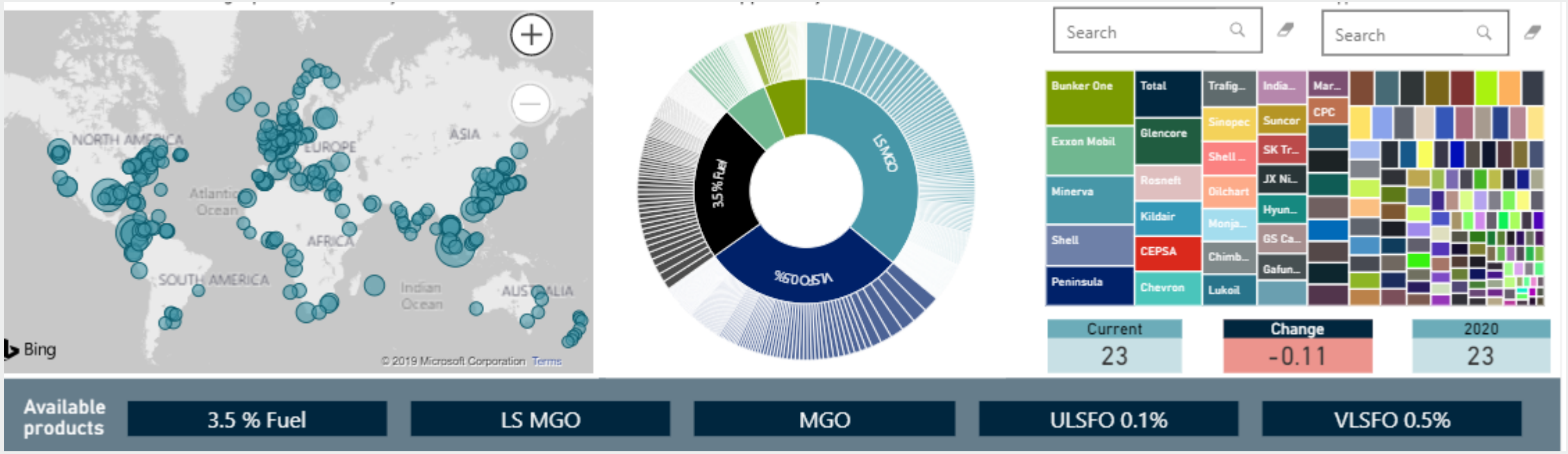
KEY POINTS TO CONSIDER: THE SUPPLY SIDE

- MGO and HSFO grades should not be much different than what we handle today
- For VLSFO 0.5% the challenge is much greater;
  - Flow and secondary ports are likely to have to deal with the diverse range of VLSFO specifications:
    - Segregate based on Naphtenic vs Paraffinic, vs Straight Run
    - Minimum to zero chances to commingle product (barges and storage)
    - Very wide range on viscosity – 60 CST up to 300+ CST

PREPARATION FOR THE TRANSITION

2020 SUPPORTING TOOLS

2020 PORT/SUPPLY AVAILABILITY



2020 BH SUPPORTING TOOLS

VLSFO 0.5% BLEND DNA & COMPATIBILITY TOOL (WIP)

Product on Board	Paste results below	Product to be Supplied	Paste results below
Viscosity @ 50 C.	20	Viscosity @ 50 C.	35
Density @ 15 C.	856.6	Density @ 15 C.	862.1
Pour Point	30	Pour Point	15
Micro Carbon Residue (MCR)	0.1	Micro Carbon Residue (MCR)	0.166
Aluminium + Silicon (Cat Fines)	1	Aluminium + Silicon (Cat Fines)	2
Score	9.42	**Score**	18.56
Paraffinic Product	Yes	Paraffinic Product	Yes
Stability test	No	Stability test	No

Product 1	Product 2	Compatibility
Paraffinic	Paraffinic	OK

Explanation

Product 1	Product 2	Compatability
Paraffinic	Paraffinic	OK
Not Paraffinic	Not Paraffinic	OK
Paraffinic	Not Paraffinic	NO
Not Paraffinic	Paraffinic	NO

KEY TAKEAWAYS

PRICE IMPACT & SPREADS

- Will have a major impact on shipowners
- Our advice to customers - Differentiating factor
- Minimize risk to be left with the most expensive fuel option
- Credit environment will be more challenging

MANAGING MULTIPLE GRADES

- Bunker procurement will be more complex
- Understanding basic product characteristics, 0.5% blends DNA
- Information sharing will be very valuable

QUALITY IMPACT

- Impact to operations on board the vessels
- Plan for the transition. Tank cleaning & Fuel switchover procedures.
- KYS Know your supplier

THANK YOU

Bunker Holding Group