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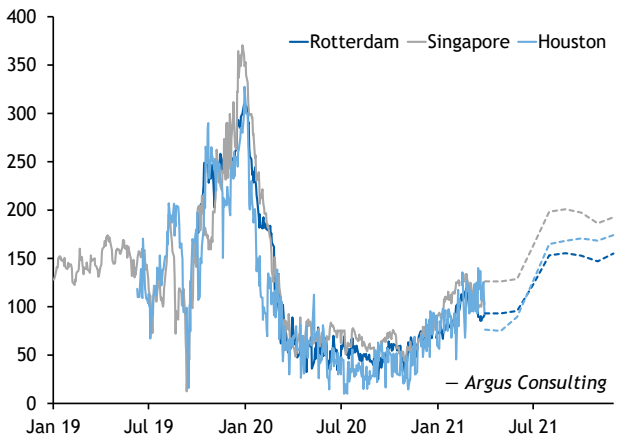
Argus Marine Fuels Outlook

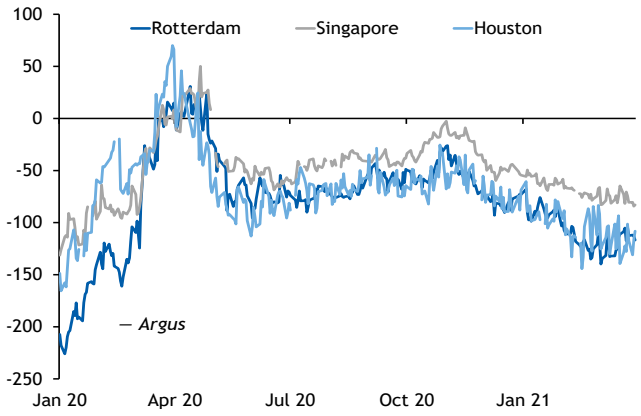
Highlights

- The very low-sulphur fuel oil (VLSFO) and high-sulphur fuel oil (HSFO) spread continued to widen in the first quarter — reaching pre-pandemic levels — largely reflecting a fall in HSFO cracks.
- VLSFO demand in most hubs is strong and VLSFO cracks were higher in the first quarter in Singapore, Houston and Fujairah against regional benchmarks.
- VLSFO prices look well supported going forward — the grade's share of the market is already high, at 70pc.
- With fluid catalytic cracker (FCC) utilisation increasing on stronger gasoline demand, prices should also be buoyed by tighter VGO availability.
- HSFO prices are likely to come under pressure as global refinery runs rise, despite tight availability of heavy and medium crude grades.
- As a result, the VLSFO-HSFO spread could average around $150/t in the second half of the year in Rotterdam.

VLSFO vs HSFO spreads *$/t*



HSFO crack spreads *$/t*



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Overview

Based on data for four main bunker hubs — Singapore, Rotterdam, Spain and Panama — it seems the marine fuels market shrugged off the impact of the pandemic, with bunker sales in the four hubs up by 5pc in 2020. The data also show the market has widely adopted the new 0.5pc very low-sulphur fuel oil (VLSFO) standard. It is estimated that around two thirds of bunker sales now comprise VLSFO, with more recent data for Fujairah suggesting that it has a share of more than 80pc there. Early concerns over the ability of the refining sector to meet demand for VLSFO after the IMO specification switch at the start of last year have proved unfounded. More than enough has been available to meet demand, and for most of 2020 VLSFO prices were remarkably weak relative to high-sulphur fuel oil (HSFO). The VLSFO premium started the year at almost $250/t, but it had collapsed to less than $50/t by the middle of the year. It started to grow again in the second half of 2020, but in December it was still at only 30pc of January's level.

Given the strength of VLSFO demand in 2020, it is clear the price weakness is attributable to the supply side — specifically, refiners' response to the collapse in demand for transport fuels, in particular gasoline. Historically, when bunker fuel comprised just HSFO and marine gasoil (MGO), the outright price for bunker fuels was primarily determined by the price of crude — and to a slightly lesser extent the relative overall profitability of refining. This is still the case, but with the bunker pool now dominated by VLSFO, the market is more exposed than ever to the overall refining margin and, for the first time, directly to gasoline market conditions.

The reason for this is the use of VGO to make VLSFO — in addition to low-sulphur fuel oil (LSFO), VGO is widely used to produce VLSFO. It is also the key feedstock for fluid catalytic cracker (FCC) units, which are central to gasoline supply. As a result, there is direct competition for VGO supply between gasoline and VLSFO production.

Because of this, there is now a direct link between demand for gasoline and the price of VLSFO. If gasoline demand falls, as it did in 2020, refiners do not run the FCC unit, there is less demand for VGO and more availability for bunker output. Although low overall refinery utilisation meant less VGO was produced upstream of the FCC in the first place, the end result was that ample VGO availability led to weaker feedstock prices and lower VLSFO prices.

Last year's extraordinary conditions meant that this effect was particularly pronounced — but even in a normal market environment this will happen. In most regional refining systems, the marginal refinery process is catalytic cracking. Overall demand is insufficient to result in full capacity utilisation of the FCC, and so with spare FCC capacity available, utilisation will fluctuate in line with FCC margins — rising when margins rise and falling when margins fall. This means that VGO availability will also fluctuate and, ultimately, VLSFO values as well.

VLSFO prices are rising now because gasoline demand is starting to recover and VGO availability is tightening. This is a key factor in our forecast that the VLSFO-HSFO spread will widen steadily through to the end of this year, when we see it reaching the kind of levels seen in early 2020. The other factor underpinning this move is the HSFO price, which will weaken as overall refinery utilisation increases in line with demand recovery.

The rise in VGO prices is a key factor for why VLSFO values rose more strongly than most other bunker products in January-March. But all bunker prices have increased — by 30-35pc. This was driven by the strong crude rally as the market priced in the roll-out of vaccination programmes and an impending end to lockdowns.

Opec+ surprised the market in early March by deciding not to increase production quotas, and this reinforced the rise in crude values. Equally surprising was its decision in April to start raising quotas after all, even though by then prices had started to come under pressure as the market took stock of new lockdowns in key consuming areas such as Europe and India. In total, Opec+ will raise production by 2.4mn b/d on a staggered basis through July — slowing the rebalancing process in global markets, but not halting it.

The potential for demand growth to accelerate in the second half of the year should keep crude prices supported. The end of lockdowns will inevitably release pent up demand — not least for transport fuel and not least in the US, where there are mounting expectations that the upcoming driving season will see gasoline demand surge. This could point to higher VLSFO values, although any rise should be capped to some extent by prices for competing MGO, which will continue to be held back by the persisting middle distillate surplus.

Price outlook

VLSFO-HSFO differential continues to widen

After starting to climb at the end of 2020, the very low-sulphur fuel oil (VLSFO) and high-sulphur fuel oil (HSFO) spread continued to widen in the first quarter of this year, reaching pre-pandemic levels. The spread in northwest Europe peaked at $120/t in February and exceeded $130/t in Singapore, moving towards the values that shipowners forecast when they first evaluated scrubber investments. As oil markets continue to recover from Covid-19, a wider spread could become the norm, encouraging further investment in scrubbers. For some time, we have been forecasting a widening spread as the market starts to regain some equilibrium, but lower global HSFO pricing in the face of increasing refinery utilisation now suggests that the spread this year could return to levels seen early in 2020.

Wider spreads in the first quarter of 2021 largely reflect a fall in HSFO cracks. In northwest Europe, the average crack for HSFO against North Sea Dated was $3.10/bl down on October-December. This was partly the result of subdued transatlantic demand, as US Gulf coast refiners' runs slumped following power outages caused by freezing weather. Last year, US refiners emerged as large importers of Russian fuel oil for use as coker feedstock, and now the absence of this demand has caused a backlog of supply in Europe. Independent fuel oil stocks in the Amsterdam-Rotterdam-Antwerp (ARA) region hit a record high in early April, having built steadily each week since the start of the year.

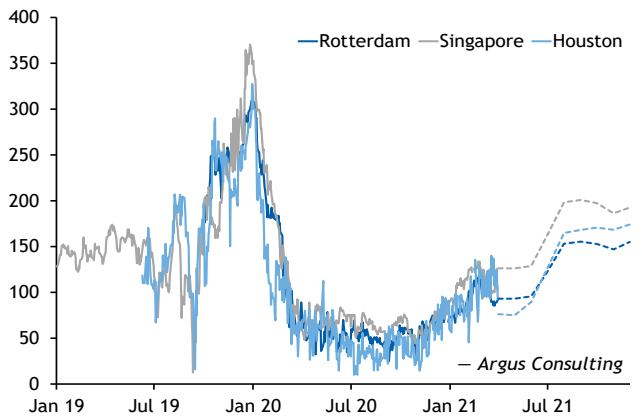
Tighter HSFO supplies were also compounded by the impact of the pandemic, which caused global refinery throughputs to fall sharply with the collapse demand. Global refinery run rates fell by an estimated 10pc in 2020, but this was outpaced by a fall in HSFO production of around 37pc. Demand was already lower at the start of 2020 — before the pandemic took hold — because of the IMO 2020 changes, so the reduction in supply supported prices and kept the global HSFO balance in line with 2019. As refinery utilisation picks up, supply is likely to increase to a greater extent than demand, shifting the balance further into a surplus and squeezing HSFO values for the rest of the year.

With shipowners preferring to install scrubbers on newbuilds, rather than opting for costlier retrofits, it will a while before we can expect any meaningful increase in HSFO demand. Most scrubbers currently on order are for newbuilds, so the short-term scope for HSFO demand growth seems minimal. As refinery runs climb, HSFO cracks look likely to keep falling, reflecting increased supply with no imminent source of demand growth.

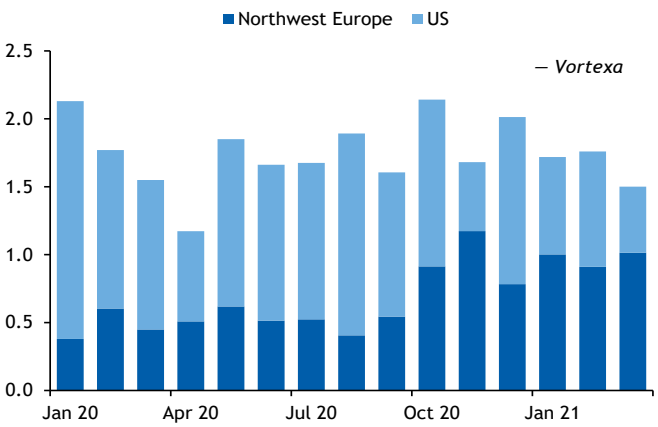
On the other hand, VLSFO demand in most hubs is strong and VLSFO cracks were higher in the first quarter in Singapore, Houston and Fujairah against regional benchmarks. In Singapore, January's overall bunker sales were the highest in a year, and VLSFO sales the highest since March 2020. Cracks in Europe continued to decline in 2021, falling to minus $23/t in March as refinery run rates recovered and supply within the region increased.

VLSFO prices look well supported going forward — the grade's share of the bunker market is already high, at a

VLSFO vs HSFO spread *$/t*



Russian HSFO exports *mn t*



steady 70pc. With fluid catalytic cracker (FCC) utilisation rates increasing in response to stronger gasoline demand, prices should also be buoyed by tighter VGO availability. HSFO prices are likely to come under pressure as global refinery runs rise, despite tight availability of heavy and medium crude grades. As a result, we now believe that the VLSFO-HSFO spread could average around $150/t in the second half of the year, basis Rotterdam.

VGO cracks still supported by rising gasoline demand

Vacuum gasoil (VGO) cracks have been supported this year as global gasoline demand recovers, albeit slowly. The spread between VGO and VLSFO reached a six-month high in March. This coincided with gasoline cracks moving above VLSFO cracks for the first time in six months in northwest Europe against North Sea Dated. March gasoline cracks exceeded $7/bl in northwest Europe against North Sea Dated, a level last seen in November 2019. In the US, gasoline cracks moved even higher — to over $17/bl against LLS — driven by refinery outages.

Heading into summer, gasoline demand is expected to increase further, leading to more VGO consumption as FCC feedstock. As gasoline cracks move above VLSFO cracks, this will divert VGO away from the VLSFO bunker pool as refiners seek higher margins. On the US Gulf coast, with gasoline consumption growing and refiners grappling with the aftermath of refinery outages, FCC margins hit their highest since September 2017 — the last time gasoline cracks were above $17/bl. This tightness has had a knock-on effect in Europe, with much more gasoline material leaving for the US. This has helped support gasoline in Europe, with the same feed through for VGO.

As gasoline cracks increase, and there is more competition for VLSFO feedstocks within refineries, VLSFO prices should rise as supply tightens. With gasoline demand poised to grow moving into summer and as lockdowns are eased, there will be more pressure on the VLSFO supply pool as blending components are increasingly used in FCCs. In early April, gasoline's premium to VLSFO hit a record high in northwest Europe, increasing the competition for feedstocks between FCC units and the fuel oil blending pool.

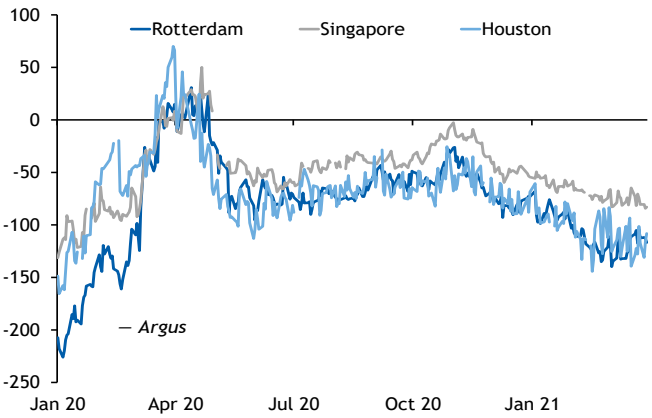
MGO under pressure in northwest Europe

The recovery in gasoline markets has also had a sharp impact on marine gasoil (MGO). Globally, middle distillate stocks are still at a surplus, but refinery output has increased as runs have risen to supply gasoline. As a result, middle distillate cracks have weakened recently, which has impacted MGO cracks in northwest Europe. These fell throughout the quarter, weakening particularly in March, when they averaged $16/t, down from $29/t in February.

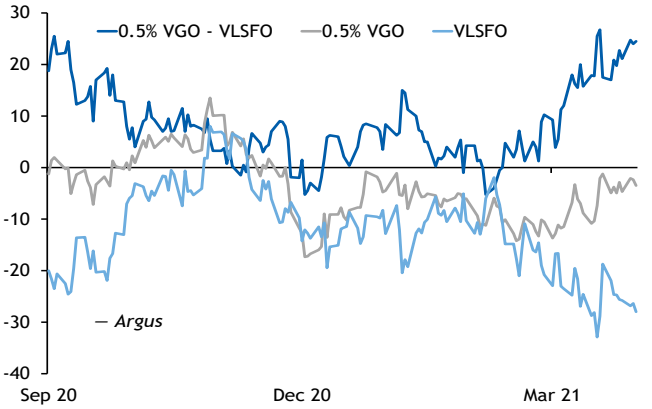
MGO is also being weighed down by thin diesel demand in Europe and India. Both have seen a resurgence in coronavirus cases in recent weeks. Europe continues to lag behind the US and UK in rolling out vaccines, and poor vaccine availability has led to a second wave in India, which now has the highest number of cases globally. Renewed lockdowns in India and Europe are expected to suppress diesel demand, as both have a high proportion of diesel passenger cars. Poor margins for road diesel could see refiners divert distillate to marine pools, which will weigh on MGO cracks.

The MGO-VLSFO spread has historically been similar in Rotterdam and Singapore, with notable divergence in March and

HSFO crack spreads *$/t*



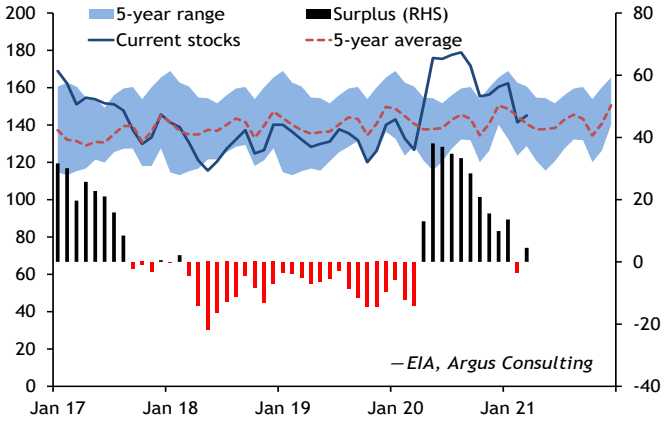
Northwest Europe: VGO vs VLSFO spreads *$/t*



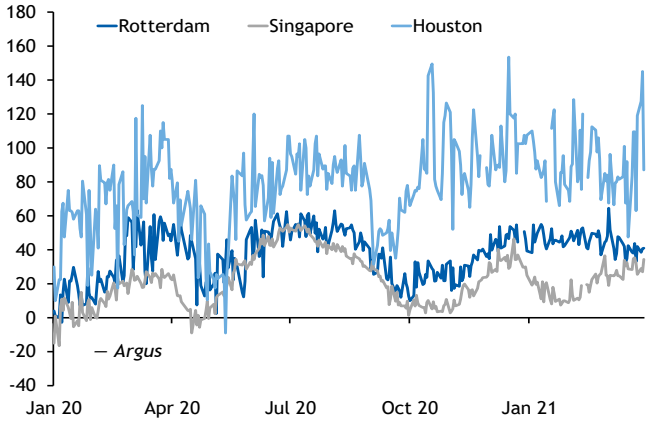
Forecast bunker prices													*$/t*
Fob	**4Q20**	**1Q21**	**2Q21**	**3Q21**	**4Q21**	**1Q22**	**2Q22**	**3Q22**	**4Q22**	**1Q23**	**2Q23**	**3Q23**	**4Q23**
Rotterdam													
HSFO 380cst	252	336	339	328	342	352	304	296	296	282	282	290	290
0.1% MGO	366	489	495	535	563	553	494	482	487	494	490	495	498
0.5% fuel oil	326	442	448	482	507	498	444	429	430	434	431	435	438
Singapore													
HSFO 380cst	275	355	350	325	345	364	314	303	308	294	292	297	302
0.5% fuel oil	346	466	467	501	527	518	463	449	449	454	450	455	457
Houston													
HSFO 380cst	255	332	339	315	323	365	316	302	310	302	294	297	304
0.5% fuel oil	337	460	471	506	533	523	467	451	452	457	453	458	460
Fujairah													
HSFO 380cst	267	349	344	318	339	357	307	297	302	288	286	291	296
0.5% fuel oil	351	470	467	501	527	518	463	449	449	454	450	455	457

Delivered	**4Q20**	**1Q21**	**2Q21**	**3Q21**	**4Q21**	**1Q22**	**2Q22**	**3Q22**	**4Q22**	**1Q23**	**2Q23**	**3Q23**	**4Q23**
Rotterdam													
HSFO 380cst	268	347	353	337	355	361	313	305	309	291	291	299	304
0.1% MGO	365	484	496	539	569	558	497	484	489	496	492	497	500
0.1% fuel oil	361	479	485	518	544	534	481	470	474	481	477	481	484
0.5% fuel oil	332	443	452	485	511	502	448	433	434	438	435	439	442
Algeciras													
HSFO 380cst	302	369	362	343	352	378	330	324	323	312	312	322	321
0.1% MGO	397	516	540	584	620	606	544	529	540	544	539	542	551
0.5% fuel oil	348	460	471	505	531	521	467	453	453	458	454	459	461
Singapore													
HSFO 380cst	291	365	361	335	356	374	325	314	319	305	303	308	313
0.1% MGO	378	503	516	562	590	576	514	499	504	517	513	516	520
0.5% MGO	369	493	505	550	578	564	502	487	493	506	502	505	508
0.5% fuel oil	368	494	493	527	553	543	489	475	475	480	476	480	483
Houston													
HSFO 380cst	268	345	360	332	340	382	333	320	327	319	311	314	321
0.1% MGO	413	535	545	601	629	596	529	522	526	533	524	535	538
0.5% fuel oil	318	443	466	513	540	530	473	458	459	463	460	464	467
Fujairah													
HSFO 380cst	270	357	355	329	350	368	318	307	313	298	296	301	307
0.1% MGO	435	555	586	632	660	645	584	569	575	587	583	586	590
0.5% fuel oil	359	479	475	509	534	525	471	457	457	462	458	462	465

US middle distillate stocks *mn bl*



MGO vs VLSFO spreads *$/t*



April last year, as the pandemic hit Singapore before Europe. This divergence reappeared at the start of this year, as the spread remained stable in northwest Europe, but fell in Singapore. This reflected the strength in VLSFO sales in Singapore, which supported prices, lowering the spread between gasoil and VLSFO. As prices between the two fuels converged, this pushed MGO sales in Singapore to a 10-month high in February.

Middle distillate stocks fall globally

Refinery outages in the US eased the pressure on stocks, as US distillate inventories hit an 11-month low in February and also sank to a deficit to the five-year average for the first time in 11 months. Distillate demand in February exceeded that of any month in 2020, and was greater than the 2019 average, before falling in March and pushing stocks back into a surplus. Inventories fell elsewhere, too, with Singapore middle distillate and independent ARA gasoil stocks hitting at 11-month lows towards the end of last month. In Europe as a whole, distillate stocks were drawn down at the end of last year, but they are still at a significant surplus to the five-year average.

This draw on gasoil stocks and recovery in demand should keep gasoil cracks stable in the next few months. Into summer, we see cracks starting to increase again, pushing back into double figures in northwest Europe in the second half of the year. With jet fuel demand likely to rise over summer, refiners will look to stop diverting unwanted jet fuel into the gasoil pool. This should support gasoil cracks, although any recovery could slow if refiners chase a strong gasoline crack and end up overproducing middle distillates.

Forward curves *$/t*

			2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23
US											
3% residual fuel oil	USGC	Swap	343	337	326	321	318	314	309	314	316
ULS heating oil	NY Harbor	Physical	521	525	528	529	524	525	527	525	516
Fuel oil 0.5%	USGC	Physical	480	481	474	469	464	460	456	463	474
Fuel oil 0.5%	NY Harbor	Physical	474	474	468	462	458	453	449	456	467
Europe											
Gasoil futures	ARA	Futures	511	515	517	517	516	516	515	514	513
HSFO cargo	NW Europe	Swap	342	334	321	315	312	309	304	301	298
3.5% fuel oil	Mediterranean	Swap	335	328	315	312	310	306	301	298	296
Asia-Pacific											
HSFO 380cst	Singapore	Swap	355	349	340	336	333	330	326	323	322
HSFO 380cst	Japan	Physical	385	378	368	364	361	358	353	351	349
HSFO 380cst	South Korea	Physical	375	368	359	355	352	348	344	341	340
0.5% gasoil	Singapore	Physical	497	500	500	500	500	499	497	496	495

Scrubbers

Scrubber orders remained slow as the year started, even as the spread between very low-sulphur fuel oil (VLSFO) and high-sulphur fuel oil (HSFO) widened, further supporting investment decisions. During March, the spread reached over $100/t in the major shipping regions, with HSFO prices declining throughout the first quarter.

As the spread between fuel oil prices increases, the payback period for scrubbers will continue to decline. Currently, the payback period is around three years for retrofitted scrubbers on bulk carriers, and slightly lower for very large crude carriers (VLCCs). Over the next few months, as spreads increase further, the payback period looks likely to decline to less than two years for bulk carriers and around 18 months for VLCCs.

Wartsila, the largest scrubber manufacturer by market share, claimed that shipowners are holding back on orders for scrubbers because of uncertainty over the future direction of fuel oil prices. As the VLSFO-HSFO spread was volatile last year, shipowners might be more cautious when assessing investments, even as the spread begins to widen.

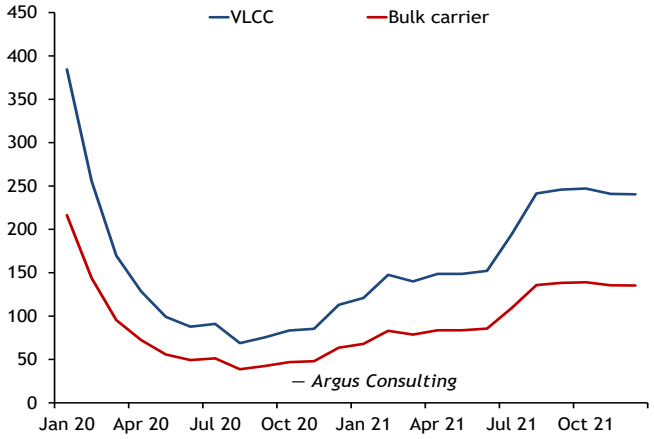
Wartsila also recently suggested that carbon capture technology could be added to scrubbers, in order to capture CO2 emissions. They said the technology is technically viable in ship scrubbers, so it could play a role in meeting the long-term emission targets that the IMO has set regarding greenhouse gases. Enhancing scrubbers versatility in meeting future IMO targets could restore confidence in investments, although this is unlikely until the IMO introduces further restrictions on emissions.

Scrubber orders

Scrubber orders announced during the first quarter were dominated by newbuilds, reflecting the lower costs involved. These lower costs mean the investments will have a shorter payback period than retrofits. With the uncertainty surrounding fuel oil spreads, shipowners will be looking for the lowest-cost option when opting to install a scrubber. As newbuilds will take longer to hit the water than retrofits, any increase in HSFO consumption by these scrubbers will be years — rather than months — away.

Seaspan announced that it had ordered eight new scrubber-fitted containerships over the quarter, with deliveries expected throughout 2022 and 2023. Algoma Central Corporation recently took delivery of a scrubber-fitted dry-bulk carrier, the 10th scrubber-fitted vessel in its fleet. The dry-bulk carrier was fitted with a closed-loop scrubber, despite the additional costs, as they are not subject to the restrictions applied to open-loop scrubbers.

Savings witth scrubber installed (retrofit) *$'000/month*



Further pressure on open-loop scrubbers

In February, a European Parliament committee rejected a proposal for the European Commission to "prohibit scrubbers and discharges into the sea of waste water". Rather than an outright ban on all scrubbers, the committee said the EU should work with the IMO for a "comprehensive" consideration of the environmental impacts of open-loop scrubbers.

Elsewhere, Turkey has become the latest country to ban the discharge of scrubber wash water in its territorial waters. This means ships will no longer be able to use open-loop scrubber systems in Turkish waters. Turkey joins a growing list of countries that have banned the use of open-loop scrubbers, notably Singapore, the UAE and Saudi Arabia.

The lower installation cost of open-loop scrubbers means bans are unlikely to have much of an impact on investment decisions. Vessels that spend more time operating coastally and within ports, such as cruise ships, have typically selected hybrid and closed-loop systems. For other vessels, the additional cost of these systems can destroy the investment return. Shipowners with vessels that do not spend much time within ports have opted to switch to costlier complaint fuels when required.

Bunker supply

Refinery supply of very low-sulphur fuel oil (VLSFO) is starting to face increased competition from gasoline, now that road fuel margins have risen substantially, especially on the US Gulf coast, where crack spreads have been hovering around $20/bl above LLS crude this week.

With lockdown measures being gradually lifted in many countries, travelling will pick up, especially as the summer season approaches in North America and Europe. As gasoline cracks improve further, refiners will be incentivised to ramp up fluid catalytic cracker (FCC) runs, using more vacuum gasoil (VGO) to feed them and leaving less VGO available to divert into the VLSFO bunker pool.

At the same time, despite recovering gasoline demand, middle distillate supply is still long in all regions. Refiners continue to struggle with very low jet-kerosine demand and are minimising production of the fuel — maximising gasoil/diesel yields instead, and/or keeping their overall CDU throughput rates under control so as not to add to the middle distillate stockbuild.

Lower CDU utilisation rates in most regions and higher FCC utilisation will lead to lower VGO supply and higher VGO demand, respectively, exacerbating the competition between gasoline and VLSFO for VGO barrels.

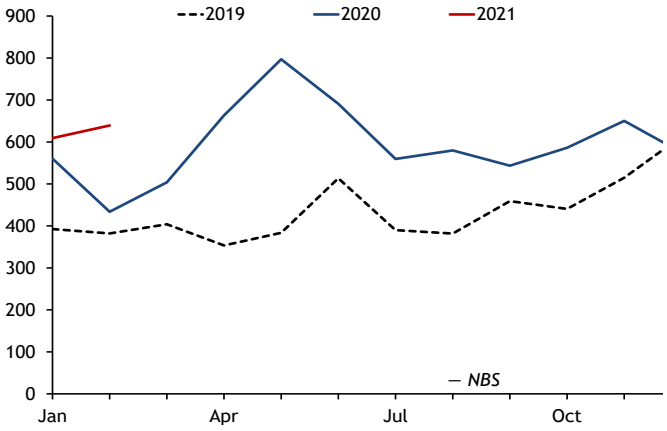
Asia-Pacific

In Asia-Pacific, recovering gasoline refining margins are expected to lead to a reduction in Chinese fuel oil production, which should help relieve high stock levels at major bunkering hubs in China.

Chinese refiners boosted fuel oil output during January-February, when the fuel oil crack against Dubai crude prices at Singapore rose. China's fuel oil production rose by 5pc to 640,000 b/d in February from 610,000 b/d in January, according to latest data from the country's NBS statistics bureau. The NBS, however, does not provide an output breakdown for VLSFO and HSFO.

Argus' data show that gasoline and VLSFO values relative to Dubai crude started to deviate from 10 February, with gasoline rising from $110/t to $148/t on 9 April and VLSFO almost halving from $50/t to $26/t over the same period. A rise in tourism during China's Qingming festival also helped

China fuel oil output *'000 b/d*



support the country's spot gasoline prices, offering Chinese refiners more incentive to lift gasoline yields and cut fuel oil yields through diverting more VGO feedstock to FCC and hydrocracking units to produce gasoline.

But it will take time for the bunker market to digest the current oversupply. Abundant volumes of VLSFO at major bunkering hubs such as Zhoushan as a result of rising domestic production and imports have eroded Chinese bunker premiums. It could take until the end of this month or early May to draw down the high fuel oil inventories — especially of VLSFO — as incremental March production also makes its way into the bunker market.

Atlantic basin

In Europe and the Mediterranean, CDU run rates are still down on their pre-pandemic levels and gasoline margins are still recovering, incentivising higher FCC runs. But an added factor that is likely to contribute to lower VLSFO supply is the permanent closure of several refineries, including Galp's 110,000 b/d Porto plant in Portugal and Neste's 55,000 b/d plant at Naantali in Finland. Porto, which was fully decommissioned in March, used to produce VLSFO for both the domestic market and for export.

On the other hand, in the Caribbean, the February restart of Limetree Bay's refinery at St Croix in the US Virgin Islands, should offer more fuel oil blendstocks in the coming months. Initial plans envisaged 154,000 b/d of crude and 45,000 b/d of naphtha being processed mainly into low-sulphur marine fuel blendstock and ultra low-sulphur diesel.

Demand

Based on latest data and revised GDP growth assumptions, we now forecast that total bunker demand will reach 273mn t this year, up by 2pc on 2020, but down by around 10mn t from the forecast in our January report.

The pressure on economic growth and trade from continuing Covid-19 measures is keeping a lid on bunker fuel demand. But the outlook of the second half of the year should improve as vaccination programmes are rolled out and more restrictions are lifted.

Singapore

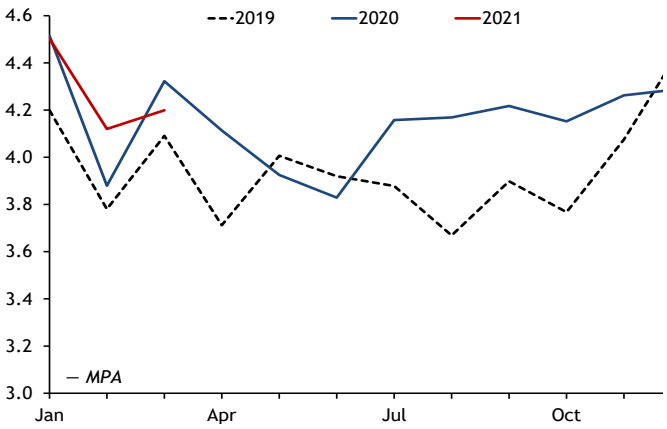
In Singapore, sales of marine fuels in March rose by 1.9pc on the month to 4.2mn t, according to preliminary data from Singapore's Maritime and Port Authority. But sales were still down by 2.8pc on the year.

Sales of very low-sulphur fuel oil (VLSFO) inched up to 2.83mn t from 2.73mn t in February. Demand for VLSFO with a maximum viscosity of 380cst, 180cst and 100cst stood at 2.13mn t, 203,000t and 500,000t, respectively.

Sales of marine gasoil (MGO) fell to 319,000t in March from 359,000t in February, while HSFO sales fell below 1mn t for the first time in six months, to 992,000t.

Bunker fuel demand					mn t
	2019	2020	2021	2022	2023
Americas					
VLSFO	0.2	20.4	20.1	20.7	21.0
HSFO	25.4	4.0	5.4	6.0	6.5
MGO	15.4	14.5	14.5	14.8	14.9
Asia-Pacific					
VLSFO	0.6	72.3	69.6	71.9	73.7
HSFO	90.6	24.2	26.0	28.1	30.1
MGO	33.4	34.3	38.0	39.1	39.7
Europe					
VLSFO	0.3	33.1	33.5	33.8	33.5
HSFO	42.2	6.9	7.4	8.1	8.6
MGO	16.2	14.1	14.3	14.9	15.1
Rest of the world					
VLSFO	0.3	21.0	21.9	22.9	23.5
HSFO	32.2	5.5	7.2	7.7	8.5
MGO	14.7	16.3	15.4	15.3	15.0

Singapore bunker sales *mn t*

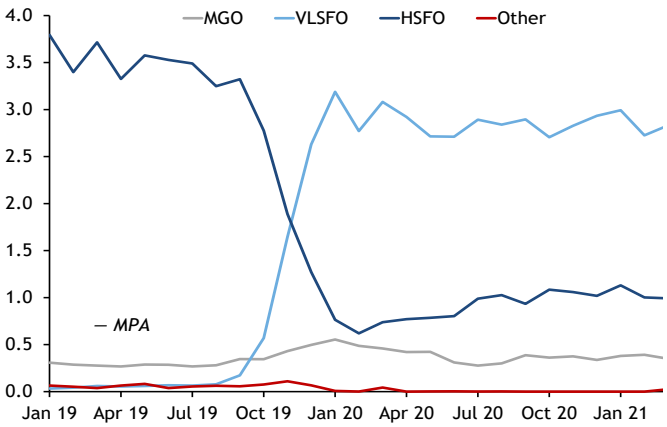


China

Bonded bunker sale volumes in eastern China's Zhoushan bunkering hub rose slightly on the month — by about 1,500t — to 386,000t in March, according to suppliers. Bunker suppliers attempted to shore up sales by cutting prices, but seasonally weak demand undermined their efforts. The oversupply of marine fuels that has resulted from higher domestic production and imports has weighed on Zhoushan bunker premiums.

China's exports of VLSFO in March could have risen by as much as 35pc from February, according to estimates from the major bunker suppliers. China granted 5mn t of VLSFO export quotas to refineries for this year for use in the bunker sector. There could be an extra 10mn t of quotas to come for 2021, but this has not been finalised yet.

Singapore bunkers sales by type *mn t*



Mediterranean

Algeciras strengthened its position as Spain's biggest bunker port in February after it continued to benefit from Suez-bound traffic and lower-priced marine fuel.

Bunker sales in Algeciras rose by 5pc from January to 189,000t in February, but fell by 3pc in Las Palmas to 162,000t, according to the transport ministry. Algeciras sold 12,000t more than Las Palmas in January, and 25,000t more than Las Palmas in February. Algeciras sales were 23pc up on the year in February, but Las Palmas sales were down by 9pc.

Las Palmas became Spain's biggest bunker port at the start of 2020, with lower prices than Algeciras, which at the time was short of fuel compliant with the IMO's 0.5pc sulphur cap. The slump in marine fuel prices as a result of Covid-19 also saw some ships choosing to sail the longer route around Africa rather than pay Suez Canal tolls, further bolstering Las Palmas' standing. But bunker prices rose in late 2020 and into 2021, reversing the trend. Algeciras retook top spot from Las Palmas in November. Increased vessel traffic into the Mediterranean and cheaper fuel costs have supported bunker demand at Algeciras. In the first two months of 2021, 0.5pc sulphur fuel oil in Algeciras traded at a $2/t discount to Las Palmas on average, against a $6/t premium a year earlier. Liquid bulk traffic in February fell by less than 1pc from January in Algeciras, but by 30pc in Las Palmas.

The smaller port of Ceuta, across the Strait of Gibraltar from Algeciras, has also benefited from increased traffic. Bunker sales in Ceuta rose by 4pc on the month in February to 32,000t. But demand at the smaller port of Tenerife on the Canary Islands, like Las Palmas, has fallen — by 26pc on the month to 24,000t in February. The combined volume of fuel sold at all Spanish ports in February fell by 1pc on the month to 552,000t. On the year, overall Spanish sales fell by less than 1pc, propped up by a rise of over 20pc at Algeciras.

Gibraltar does not publish bunker sales figures, but the number of bunker calls at Gibraltar fell to 355 in February from 465 in January.

Bunker sales in Turkey fell for a second consecutive year in 2020 — by around 10pc. At Istanbul, which makes up the vast majority of Turkish sales, 2.2mn-2.3mn t of bunker fuel was sold last year, according to suppliers, a fall of 8-12pc from 2.5mn t in 2019. The number of vessels transiting the Bosporus strait dropped to 38,404 in 2020, down by nearly 7pc on 2019 as the Covid-19 pandemic hit global trade. But in comparison with other parts of the Mediterranean region, Istanbul sales help up well. Bunker sales at Spanish ports fell by nearly 20pc in 2020, and suppliers at Piraeus, Greece, say sales might have fallen by as much as 30pc.

Turkey's bunker sales totalled 229,000t in December, according to energy regulator EPDK, up by 11pc from November. Sales at Istanbul hit a low point in the middle of 2020 and improved through the second half of the year. Overall Turkish sales in the final quarter of 2020 were 9pc higher than a year earlier, at 670,000t.

Demand for marine fuels in Istanbul often increases in the European winter, because of difficult bunkering conditions in the Black Sea. But prices at Istanbul have been higher than at competitor ports like Piraeus because of a lack of domestic supply. Turkish suppliers told *Argus* that bunker demand has been weak this year, and that sales in January and February could have been as much as 40pc down from a year earlier as demand for marine fuel is poor across Europe amid the continuing lockdowns.

Northwest Europe

Bunker volumes at Dutch ports were almost unchanged on the month in January, falling by just 1pc to 960,000t. But they were 14pc lower on the year as a result of the pandemic's continuing impact on global trade.

Demand for bunkers at Rotterdam and Amsterdam has been weak in 2021. But larger ports have recorded higher demand than smaller ports during the pandemic, and Rotterdam sales actually rose in 2020.

Supply of HSFO at Rotterdam fell by 36pc on the month to 75,000t in January. HSFO sales in Rotterdam were strong in the final quarter of 2020 as more ships retrofitted with scrubbers returned to sea. But supply of low-sulphur fuel — 0.5pc VLSFO and 0.1pc fuel oil — increased by nearly 8pc on the month in January to 711,000t. Strong margins for 0.5pc fuel oil against crude at the start of the year in northwest Europe as a result of export demand from Asia incentivised production, even though local demand was weak. This 0.5pc export demand, alongside weak local bunker demand, meant that delivered 0.5pc fuel oil prices were regularly below fob values earlier this year. Supply of MGO has been ample in northwest Europe this year, and Dutch MGO supply rose by 1pc on the month to 176,000t in January.

Crude markets

Having set sail just a month earlier on what seemed an ultra-cautious policy heading, Opec+ decided at its 1 April meeting to chart a new course. North Sea Dated had been falling steadily ahead of the meeting, losing around 10pc of its value in the previous two weeks. So most expected another rollover in quotas, while unofficial comments from within the Opec+ camp suggested that any increase towards permitted phase-three levels would be no more than 0.5mn b/d.

Instead, the group cast caution to the wind — albeit in a staggered way — with quotas hitting full phase-three levels in July. At the same time, Saudi Arabia's additional 1mn b/d unilateral cut will be wound back. In total, this could return more than 2mn b/d to the market by July (*see graph*).

Saudi oil minister Prince Abdulaziz has described this as "a very conservative measure". But with lockdowns reimposed in India and Europe, plus disparities in the pace of vaccine roll-outs and few signs of any acceleration in the demand recovery, this seems strange. There are reasons to be more optimistic about the demand outlook. The US is pushing forward with huge stimulus packages, and with national lockdown already a thing of the past, the country is on course to achieve herd immunity to Covid-19 as early as August. GDP growth in China is relatively strong and in its latest *World Economic Outlook*, the IMF upgraded its forecasts for global GDP growth in 2021-22. But the fact remains that at a global level, the pace of recovery is a two-tiered affair.

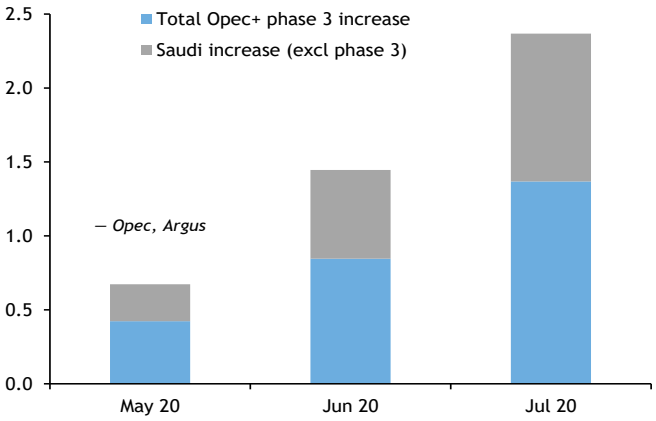
Despite the unexpected decision to increase production, prices have not fallen. There has been some reduction in net speculative length, but the overall level remains high. The decision to release more crude to the market certainly takes away much of the support for prices, while increasing the possibility that values could fall if the demand outlook starts to weaken. But this increase in output does not halt the rebalancing process — it merely slows it down. The market is left undecided and prices are trading in the $60-65/bl range.

Meanwhile, the first tentative steps towards the removal of sanctions on Iran have been taken. After a recent meeting in Vienna between Iran and the P5+1 grouping — minus the US — it was agreed to set up working groups to find ways of moving towards the removal of sanctions and the return of Iran to compliance with the Joint Comprehensive Plan of Action (JCPOA). Inevitably, progress will be slow and we still expect no meaningful return of Iranian exports until the end of this year at the earliest. But the news gives the market a glimpse of what probably now lies ahead.

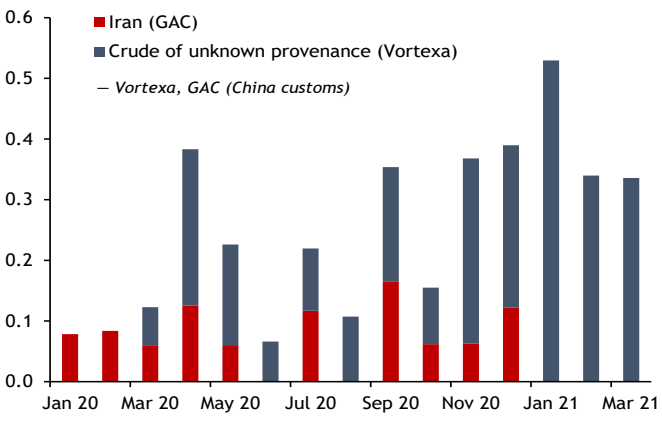
In fact, Iranian barrels are already trickling back to market. On the basis of official data, China imported some 100,000 b/d of Iranian crude in 2020 and none so far this year. But it is likely the true level of Iranian exports is much higher (*see graph*). The recent move by Saudi Aramco to raise May OSPs for Asian customers, but to reduce them for European and US buyers, was greeted with dismay by Indian refiners, which responded by sharply reducing nominations. This could result in Iranian barrels starting to find their way back to India.

Opec+'s efforts to navigate the wreckage a year ago have been remarkably successful, and after the March meeting

Opec+ crude output quota increases ***mn b/d***



Iranian crude to China: Offical/estiamted ***mn b/d***

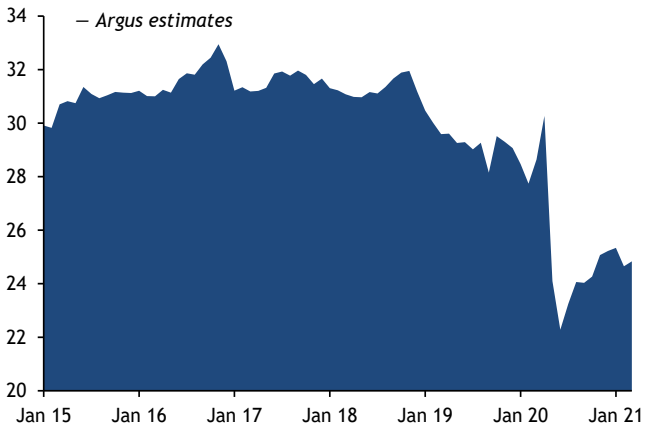


it looked like the group was going to keep a firm grasp on events. Its latest decision changes this view. We might say we were not surprised by the decision to raise output — we noted in the most recent edition of *Argus Fundamentals* that production would need to rise to supply crude burn for the peak summer cooling season in the Mideast Gulf — something that Prince Abdulaziz admitted helped the group come to its decision on 1 April. But it is also difficult to escape the conclusion that quota fatigue is growing.

If so, this is not the right time to succumb. Market management will only get tougher in the months ahead. The improving Covid-19 and economic situations are likely to erode individual producers' determination to keep crude off the market — and all the while, the amount of crude seeking market share is likely to be rising. Libya hopes to be producing 1.45mn b/d by the end of 2021, and has produced an average of 1.17mn b/d this year. Iran has stated that it must be allowed to export at least 2.3mn b/d once it has rejoined JCPOA, against an average of just 0.3mn b/d last year.

And next year may see US output starting to grow again. Capital discipline and market uncertainty have kept US producers from upping investment this year and, ironically, their hedging strategy means most will see no added benefit from high prices. According to Rystad Energy data, hedges

Opec total crude output (to Mar 21) ***mn b/d***



in place protect producers from prices below $45/bl, but the use of collars means that they receive no additional revenue for prices over an average of $53/bl. But if prices are still strong when the hedging programme expires, the urge to increase investment again might become too much to resist.

The recent decision to increase production means the rebalancing process will still be a work in progress when the current Opec+ agreement expires in April 2022. There is a growing possibility that Opec will have to face this challenging and competitive environment on its own.

Forecast crude prices													***$/bl***
	4Q20	**1Q21**	**2Q21**	**3Q21**	**4Q21**	**1Q22**	**2Q22**	**3Q22**	**4Q22**	**1Q23**	**2Q23**	**3Q23**	**4Q23**
North Sea Dated	44.1	60.8	62.0	62.7	65.0	65.0	57.0	54.7	55.0	55.0	55.0	55.0	55.0
Urals NWE	44.0	59.5	59.8	60.2	62.4	63.1	54.7	52.4	53.1	52.8	52.5	52.5	52.9
Dubai	44.6	60.1	60.6	61.1	63.4	64.2	55.9	53.7	54.3	54.0	53.6	53.7	54.1
Murban	44.5	60.1	61.6	63.2	65.3	65.6	57.4	55.2	55.6	55.9	55.6	55.7	55.8
ESPO Blend	46.2	60.6	62.0	62.8	65.2	66.3	58.4	56.0	56.8	56.4	55.8	55.7	56.3
LLS	44.1	60.0	61.6	61.9	64.4	64.0	55.8	53.2	53.8	53.8	53.4	53.2	53.5
Mars	43.2	58.3	60.2	60.5	63.3	63.0	54.5	52.2	53.4	52.9	52.0	51.8	52.9
Maya USGC	40.5	56.4	56.8	54.9	57.7	59.7	51.3	48.7	50.2	49.2	48.2	47.7	49.2

Forecast crude differentials													***$/bl***
	4Q20	**1Q21**	**2Q21**	**3Q21**	**4Q21**	**1Q22**	**2Q22**	**3Q22**	**4Q22**	**1Q23**	**2Q23**	**3Q23**	**4Q23**
Urals NWE vs North Sea Dated	-0.1	-1.4	-2.2	-2.4	-2.6	-1.9	-2.3	-2.2	-1.9	-2.2	-2.5	-2.5	-2.1
ESPO Blend vs Dubai	1.6	0.5	1.3	1.7	1.8	2.1	2.5	2.4	2.5	2.3	2.2	2.0	2.2
Murban vs Dubai	-0.1	-0.0	0.9	2.1	1.9	1.4	1.6	1.5	1.3	1.9	2.0	1.9	1.7
Mars vs LLS	-0.9	-1.6	-1.4	-1.4	-1.1	-1.0	-1.2	-1.1	-0.4	-0.9	-1.4	-1.4	-0.6
Maya vs LLS	-3.5	-3.6	-4.8	-6.9	-6.7	-4.2	-4.4	-4.6	-3.6	-4.6	-5.2	-5.5	-4.3

Alternative bunker fuel news

LNG

China's state-controlled CNOOC signed a deal with China State Shipbuilding (CSSC) and Guangdong Shipping Group to provide LNG as bunker fuel for 50 bulk carriers that the Chinese shipping firms will design and build. The firms did not state when the LNG bunker supply agreement will start or when construction of the vessels will be completed. The vessels are expected to ply the Pearl river delta area that is one of a few emissions control areas in China, including the Yangtze river delta and the Bohai bay region, where sulphur content in marine fuels has been capped at 0.1pc since 2020.

CSSC will be responsible for the construction of the fleet, of which 25 vessels will have a 2,000 deadweight tonne (dwt) capacity, while the remaining 25 vessels will have a 3,000dwt capacity. The vessels will run solely on LNG. They will be expected to meet the latest standards in energy consumption indicators, environmental performance and reliability requirements set by the China classification society, helping to curb air pollution in the country.

CNOOC began developing its LNG bunkering business in 2018. It remoulded pipelines at its 3.5mn t/yr Zhuhai LNG facility in south China's Guangdong province to prepare for LNG refuelling operations in December 2018. Together with CSSC, it signed an agreement with the Guangdong provincial government in June 2020 to convert 1,500 inland waterway vessels to run on LNG by 2025. The deal included construction of 19 LNG bunkering stations in the province by 2025 to replace fuel oil consumption.

Meanwhile, in Japan, joint venture Central LNG Shipping has performed a ship-to-ship (STS) bunkering operation for domestic firm K Line's new LNG-fuelled car carrier. The *Century Highway Green* car carrier was supplied with LNG by Central LNG Shipping's bunkering vessel *Kaguya* on 16 March, four days after the car carrier was commissioned by K Line.

The 3,500m^3 *Kaguya* is the first LNG bunkering vessel to operate in Japan and is based at power firm Jera's Kawagoe LNG import terminal, from where it will supply ships in the Chubu region. The Central LNG Shipping joint venture was set up by Japanese shipping firms NYK Line, K Line, Jera and Toyota's trading arm Toyota Tsusho to own and manage the *Kaguya*. *Century Highway Green* is the second LNG-fuelled car carrier in Japan, after NYK's *Sakura Leader*, which was delivered in October last year. NYK plans to commission a second LNG-fuelled car carrier in 2022 and in February ordered another four, with delivery targeted in 2022-23.

Hydrogen

The Port of Rotterdam and Chile's energy ministry have signed a preliminary agreement to develop green hydrogen supply. The agreement will look to set up a supply chain to export Chile's green hydrogen to Rotterdam for use across Europe. The first stage will focus on establishing Chile's green hydrogen production and local infrastructure. Chile's energy ministry said it will consider setting up other trading corridors for green hydrogen between Chile and Europe with the port of Rotterdam.

Chile has already signed a similar deal with Singapore's energy ministry. Singapore is the world's largest bunkering port by volume, while Rotterdam is the largest in Europe, and both are looking into hydrogen's decarbonisation potential, in the shipping sector especially. The IMO is targeting a 50pc cut in the shipping sector's GHG emissions and a 70pc cut in CO2 emissions — both by 2050 against 2008. And green hydrogen could have a key role in meeting these goals.

Green hydrogen is produced using electricity generated from renewable sources, but remains costly. It can be used to fuel engines, or to produce green ammonia, which could also be used to run ships.

Green hydrogen is currently significantly more expensive than conventional marine fuels and supply is short. Earlier this year, a maritime coalition including trading firm Trafigura and Lloyd's Register lobbied the EU to help fund the development of green hydrogen and ammonia.

Shipping firms such as Ardmore Shipping, Mediterranean Shipping, DFDS and Viking Cruises are investigating hydrogen as a shipping fuel. This week, four Japanese firms said they will be working to develop floating green hydrogen production and supply for the country's coastal shipping industry. The Port of Rotterdam is already looking into the possibility of building a green hydrogen plant at its Maasvlakte extension with energy firm Uniper.

Meanwhile, chemicals firm Linde is to work with Norwegian ferry operator Norled on a green hydrogen-powered ferry.

Linde said its new 24MW electrolyser at the Leuna chemicals complex in Germany will produce green hydrogen for the ferry, the *MF Hydra*, which will carry cars and passengers. Linde said the site will begin supplying hydrogen in 2022. The firm will also build onshore and onboard hydrogen storage and distribution equipment. Using green hydrogen in the vessel will cut annual carbon emissions by up to 95pc, Linde added.

Batteries

As well as hydrogen, Norled is looking at the use of battery-powered ferries to reduce emissions. It has the *MV Ampere* car ferry, which launched in 2015 and was the world's first all-electric car ferry. Construction of another fully electric ferry began in October.

Ferry firm Stena Line wants to operate two fossil fuel-free battery-powered vessels between Sweden's Gothenburg and Frederikshavn in Denmark before 2030. The *Stena Elektra* will be the first fully battery-operated ferry of its size — around 200m in length with space for 1,000 passengers and 3,000m^3 of freight capacity. Stena Line said it will outline the specifications for the vessel, which is at the concept stage, within a year and that it plans to place the first of two orders by 2025. Battery capacity will need to be 60-70MWh and be enough to cover the 50 nautical miles between Gothenburg and Frederikshavn. The Gothenburg Port Authority will build the necessary infrastructure and access to electric power for charging, Stena Line said.

The two ships are part of a project by the Port of Gothenburg and involving automakers firms Scania and Volvo to make Scandinavia's largest port fossil fuel-free. The venture aims to reduce the port's 55,000 t/yr of carbon emissions by 70pc before 2030. Gothenburg's decarbonisation project could benefit from Sea Europe's EU maritime fund and ECSA's proposal to use the EU Emissions Trading System process to fund maritime decarbonisation.

Ammonia

Danish shipping firm AP Moller-Maersk has agreed to conduct a joint feasibility study on the supply of green ammonia for ship-to-ship bunkering in Singapore, the world's largest bunker port.

The other members of the consortium are management firm Fleet Management, rig maker Keppel Offshore and Marine, the Maersk Mc-Kinney Moller Centre for Zero Carbon Shipping, Japanese trading house Sumitomo and Norwegian fertiliser firm Yara International. The feasibility study will look into creating supply chain infrastructure and designing ammonia bunkering vessels, Maersk says.

Maersk's head of decarbonisation, Morten Bo Christiansen, said the company sees green ammonia and methanol as key to its plan to decarbonise. Maersk is planning to build a green ammonia facility in Denmark. It has also pledged that all newbuild vessels in its liner fleet will be dual-fuelled. The firm's Maersk Liners subsidiary has no plans to use LNG as an alternative marine fuel. In February, Yara joined a separate group that is looking to develop ammonia-powered tankers.

Most of the world's ammonia is currently used for fertilizers. Ammonia emits no CO2 when burned, but the production of 'grey' ammonia produces significant emissions. 'Green' ammonia would be produced from renewable sources, meaning a greenhouse gas-free life-cycle. Ammonia remains too expensive for shipowners to use at the moment and green ammonia would be more expensive still.

Waste-based fuels

Rubber waste recycling firm Wastefront said bunker fuels produced from waste tyres will cut CO2 emissions by 81pc compared with those produced conventionally. Wastefront is building a plant at Sunderland in northeast England capable of processing 73,000t of waste tyres a year. The plant will start operations in 2023. Trading firm Vitol signed an offtake agreement in November to buy up to 30,000 t/yr of naphtha and fuel oil from the plant. Wastefront expects this to be exported to the Amsterdam-Rotterdam-Antwerp (ARA) trading and refining hub.

Wastefront enlisted Norwegian classification society DNV GL to conduct a life-cycle assessment of the project. DNV confirmed an 81pc emissions reduction from the bunker fuel oil produced. Bunker fuel oil will form the bulk of the Sunderland plant's production, at 69pc. The company is looking at other sites for a similar production facility, again using waste tyres as feedstock.

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