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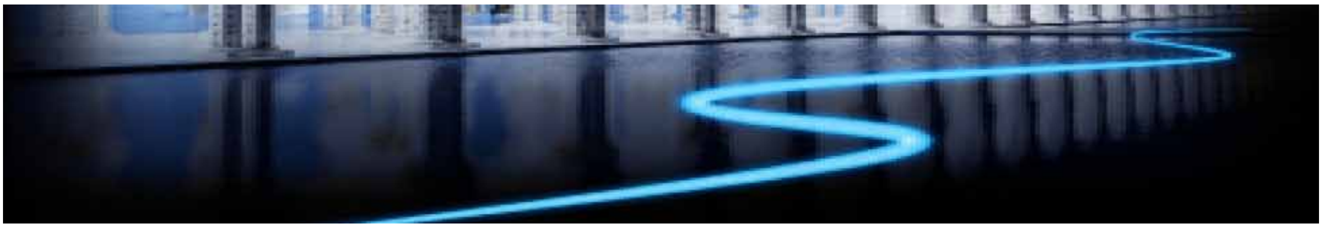
Argus Base Oils Outlook



The month ahead:

Global base oil prices are largely forecast to edge lower in the month ahead amid recovering supply availability and as seasonal demand ebbs in key markets.

Fundamentals continue to diverge in different regional markets. In Asia-Pacific, rising supply, persistent Covid-19 lockdown measures, and expectations of lower prices have prompted more buyers to hold back their procurement plans. In Europe, demand is slowing as the holiday season begins. Producers and buyers continue to keep a close eye on regional refiners' run rates. In the US, fundamentals are firmer as buyers and sellers continue to build stocks amid expectations of an active hurricane season.

The next 3-6 months:

Global base oil prices in January are generally forecast to be lower than prices in August next month.

Prices are set to face pressure in the second half of the year as seasonal demand ebbs further and as supply availability rises amid a lighter round of global plant maintenance work. A key unknown is any weather-related disruptions. The lack of any such disruptions would put more pressure on prices. Producers and buyers have sought to hold back some supplies as a buffer against any such disruptions. They would then release those supplies.

At the same time, arbitrage opportunities to move supplies from Asia-Pacific to higher-priced outlets will likely narrow the price spread between regions by curbing the surplus in Asia and boosting availability in those other markets. Any easing of logistical complications would facilitate further those arbitrage opportunities. A rise in such flows is expected to help to revert inter-regional spreads closer to historical levels.

Longer term:

Global base oil prices at the end of the forecast horizon in July next year are largely forecast to be lower compared with prices at the start of the period in August next month.

Seasonal demand is set to rise in the first half of 2022. At the same time, plant maintenance work is likely to be lighter during that period than in first-half 2021. Expectations of lower crude values in 2022 would also curb any support from higher feedstock prices.

Even so, base oil values are forecast to remain firmer than pre-pandemic levels as global refinery run rates remain steady amid weak road and air fuel demand.

A repercussion of rising base oil supply is likely to be a narrowing of the price-spread between heavy and light grades. The spread has already begun to narrow in Asia-Pacific. But it has remained at record-high levels in other regions. The high price of heavy grades relative to light grades incentivises refiners to produce more of the heavy-grade product. Any such moves are expected to narrow the price-spread closer to historical levels.

Petroleum
illuminating the markets

Forecast base oil prices

$/t

	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22
US												
Group I												
SN 150 fob export	1205	1170	1132	1084	1057	1037	1048	1061	1080	1093	1072	1049
SN 500 fob export	1626	1544	1460	1369	1292	1247	1218	1221	1229	1236	1217	1195
Bright stock fob export	2200	2098	1987	1860	1724	1645	1597	1599	1609	1611	1588	1563
SN 150 domestic	1186	1153	1114	1079	1058	1059	1069	1086	1106	1121	1103	1081
SN 500 domestic	1579	1525	1462	1384	1316	1271	1247	1252	1261	1264	1244	1224
Bright stock domestic	2208	2124	2022	1905	1784	1717	1673	1675	1685	1697	1680	1660
Group II												
N100 fob export	1321	1275	1220	1158	1109	1076	1081	1092	1107	1122	1103	1079
N220 fob export	1526	1464	1392	1308	1235	1184	1155	1134	1141	1155	1138	1116
N600 fob export	1730	1679	1609	1520	1445	1382	1350	1354	1366	1373	1352	1323
N100 domestic	1286	1251	1206	1155	1120	1099	1111	1127	1139	1152	1136	1115
N220 domestic	1485	1448	1391	1322	1255	1212	1186	1170	1179	1195	1178	1157
N600 domestic	1654	1616	1564	1498	1435	1393	1371	1374	1383	1398	1378	1359
Group III												
4cst domestic	1962	1898	1818	1721	1645	1594	1563	1567	1579	1594	1571	1546
Europe												
Group I												
SN 150 fob export	1141	1107	1070	1040	1020	1003	1014	1034	1058	1074	1059	1041
SN 500 fob export	1468	1405	1334	1252	1190	1143	1114	1124	1140	1154	1142	1127
Bright stock fob export	1860	1784	1697	1600	1522	1454	1408	1381	1396	1412	1398	1384
SN 150 domestic	1200	1164	1132	1106	1088	1074	1087	1108	1133	1151	1135	1116
SN 500 domestic	1546	1477	1402	1314	1247	1202	1174	1182	1199	1217	1203	1185
Bright stock domestic	1988	1899	1784	1664	1565	1480	1447	1454	1464	1480	1466	1449
Group II												
N150 fca ARA	1512	1467	1414	1352	1299	1273	1255	1273	1295	1312	1298	1283
N600 fca ARA	1834	1763	1682	1594	1517	1460	1426	1411	1421	1437	1421	1406
Group III												
4cst fca NWE	1647	1611	1563	1497	1438	1401	1386	1402	1424	1442	1427	1408
(a) 4cst fca NWE	1682	1645	1592	1534	1482	1449	1431	1440	1462	1479	1467	1452
(b) 4cst fca NWE	1603	1560	1503	1438	1382	1347	1329	1345	1367	1385	1373	1358
Asia												
Group I												
SN 150 fob export	825	812	795	784	776	784	800	818	841	862	847	832
SN 500 fob export	1387	1331	1264	1186	1129	1090	1098	1114	1134	1153	1139	1125
Bright stock fob export	1674	1617	1543	1458	1400	1371	1356	1372	1389	1411	1396	1382
Group II												
N150 fob export	826	816	801	791	788	799	818	843	869	892	876	858
N500 fob export	1290	1258	1214	1161	1122	1095	1109	1131	1156	1177	1164	1146
N70 cfr India	797	814	825	830	821	831	846	874	910	935	920	904
N150 cfr India	842	855	861	852	835	842	858	881	911	936	919	905
N500 cfr India	1347	1322	1291	1253	1210	1182	1169	1181	1205	1225	1211	1196
Group III												
4cst cfr Northeast Asia	1141	1124	1099	1084	1074	1084	1106	1128	1150	1172	1156	1140
4cst cfr India	1184	1158	1120	1098	1085	1077	1093	1108	1130	1154	1139	1126
4cst ex-tank UAE	1296	1273	1245	1224	1209	1197	1208	1221	1244	1267	1252	1238

US

July vs June forecast

July's base oil price outlook accounts for changes in the supply schedule, a revision of regional crude and alternative fuel price forecasts, and an updated starting point. There are no major changes from June's issue of the outlook.

July forecast

US Group I base oil prices at the end of the forecast horizon in July next year are projected to be lower than prices at the start of the period in August next month. US Group II and Group III prices are also forecast to be lower at the end of the forecast horizon than at the start of the period.

US base oil prices face the prospect of more downward pressure for the rest of the year amid a gradual recovery in supply availability and as demand shows signs of plateauing. But demand and supply fundamentals in the region remain more supportive than in other markets. Prices are also likely to remain much firmer than usual even as supply-demand fundamentals improve.

Supply availability remains tighter than usual even as a series of plant maintenance work and production issues in the region and in overseas markets has mostly drawn to a close. The Arctic storm that struck the US Gulf Coast in February this year caused extensive disruption to production. Other production issues extended the tightness. There remains uncertainty about the ongoing extent of such disruptions.

With supply tight, producers continue to focus on fulfilling term contract commitments. Some of them are working to backfill orders. Those moves are set to extend at least to September and October. New orders continue to outpace production and deliveries. This is further limiting the availability of volumes for the spot market.

The Atlantic hurricane season has also prompted a round of stock building among buyers and sellers. Some producers are holding onto more supplies as a buffer against any weather-related disruptions. Some buyers have also rebuilt and added stocks to minimize the possibility and impact of any weather-related shortage of base oils.

Lubricant demand has remained firm as more Covid-19 restrictions are lifted throughout the region. Road transport activities and car sales have risen. Rising lube prices also incentivize end-users to bring forward their procurement plans. This trend of firm demand contrasts a typical slowdown in lubricant consumption in the second half of each year.

Firm demand from neighbouring markets like Latin America are providing additional price support to US base oils. Demand remains firm in Mexico for extra-light grades. There is a wide price gap between base oil grades going into lubricant manufacturing and base oils for use as a diesel extender.

The key uncertainty for now is the possibility of any weather-related disruption. In the absence of any such disruptions, prices face the prospect of more downward pressure. For refiners, stocks that were held back as a buffer are likely to be released into the market. For buyers, excess inventories would limit the need for any replenishment supplies.

US base oil values also face pressure from increasing availability in markets like Europe and Asia-Pacific. The ongoing rise in US prices has left increasingly wide open the arbitrage to move supplies from those regions to the US.

Logistical issues have complicated such moves. Any improvement in these logistical issues would facilitate the shipment of even more supplies to the US.

Firm base oil margins are also expected to incentivize higher refinery utilisation rates should producers have the flexibility to do so.

The average price-strength ratio for US Group I base oils is currently at 3.22. For US Group II base oils, the current price-strength ratio averages 2.88.

The historical price-strength ratio for Group I base oils has averaged 1.75 since 2010. For Group II base oils, the ratio has averaged 1.61.

Current levels are likely to ease slightly because of a combination of rising crude prices and improving base oil supply availability. But they are likely to remain much firmer than usual.

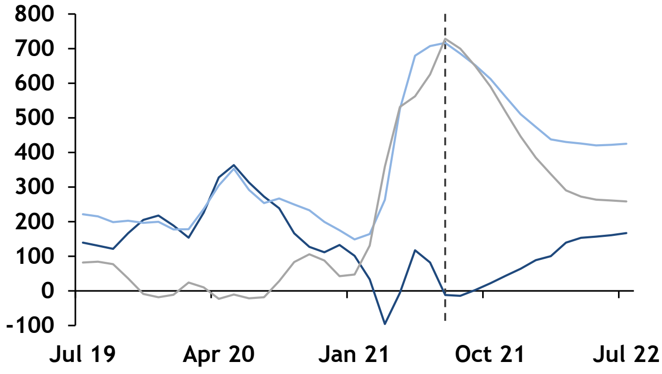
US

Supply is likely to rise on the back of a combination of ebbing demand, rising production, and shipments from other regional markets at more competitive prices. These factors are expected to outweigh margin support from an expected downward adjustment in crude values later in the year as OPEC+ targets a full end to oil production cuts by September 2022.

For US Group I base oils, the price-strength ratio is forecast to ease to an average of 2.73 by year-end. For US Group II base oils, the price-strength ratio is projected to ease to an average of 2.52.

Prices for supplies from regions like Asia-Pacific and Europe have got even more competitive versus US supplies over the past month.

Group II (N150/N220) Light-Grade spreads *$/t*



The trend has boosted interest in moving to the Americas market more surplus supplies of Group I and Group II from Europe and Asia-Pacific, as well as from the Mediterranean and Baltic Sea regions. The trend reflects weaker demand and increasing supplies in those regions following the completion of plant maintenance work.

US Group II N100 and N220 fob export prices have extended their rise over the past month relative to fob Asia Group II N150 prices. The premium of US N100 prices over fob Asia N150 has risen to $506/t, up from $403/t the previous month. The premium of US N220 prices over fob Asia prices have risen to $729/t, from $625/t the previous month. The premiums are at their highest in more than a decade and significantly higher than historical levels.

US Group II heavy-grade prices have also extended their rise relative to prices for Asia-Pacific supplies. The premium of US Group II N600 to fob Asia N500 fob export values has risen to $436/t, up from $345/t the previous month. This premium is also at a record high.

The growing availability of overseas supplies is likely to put more pressure on US base oil prices as buyers seek to both secure supplies and maximise their procurement of supplies at more competitive prices. The premium of US Group II base oils over fob Asia prices is forecast to narrow over the next 12 months as supply tightness eases.

The premium of US Group II N100 to fob Asia Group II N150 values is forecast to fall back to $221/t by the end of the forecast horizon. The premium of US N220 supplies is projected to slip to $258/t during the same period. For US Group II N600 values, the premium to fob Asia N500 is forecast to slip to $177/t.

US Group III 4cst prices are also the highest among the major regions. The trend reflects a combination of limited supply and firm demand in the US and Latin America.

The US is structurally short of Group III production capacity. It relies on imported supplies to cover most of its requirements. More recently, a drop in Group III supplies from Europe and South Korea has exacerbated the effect of that structural reliance on overseas shipments. Supplies fell because of a heavy round of plant maintenance work in those regions.

Most of that maintenance work has now come to an end. As availability improves, producers are likely to target higher-priced outlets like the US. These moves would put pressure on outright Group III prices in the region.

US domestic Group III 4cst values are forecast to slip to around $1,545/t by the end of the forecast horizon. Excluding prices in the second and third quarters of this year, the price would still be close to their highest in a decade.

Europe

July vs June forecast

The price forecast for July accounts for changes in the supply schedule, an updated regional crude and refined products price forecast, and an updated starting point. There are no major changes from June's price forecast.

July forecast

Europe Group I base oil prices at the end of the forecast horizon in July next year are projected to be lower than prices at the start of the period in August next month. Fca Antwerp-Rotterdam-Amsterdam (ARA) Group II and fca domestic northwest Europe (NWE) Group III prices are also forecast to be lower.

European base oil values are forecast to adjust lower in the upcoming months as less-supportive demand, supply, and feedstock fundamentals put pressure on prices.

More buyers have begun holding back from securing more supplies. There is weaker interest in securing Group I base oils than for Group II and Group III base oils.

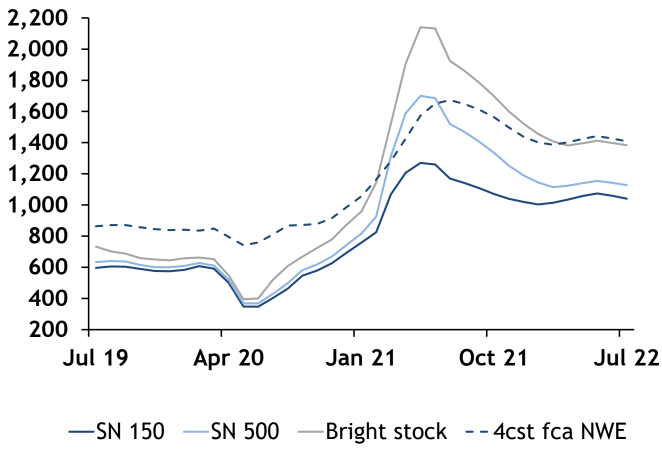
The trend is likely to persist until buyers are more confident that prices have bottomed out.

Buyers are holding back partly because of expectations of lower prices in the second half of the year. Many of them are holding back to avoid locking in prices at higher levels. More of them are also considering turning to the spot market and reducing term volumes because spot prices are reflecting the changing supply fundamentals faster than term prices.

Seasonal demand is also typically lower in the second half of each year than the first half. Demand typically slows even more during the third quarter, when some blenders cut requirements during the holiday season. Some of them reduce their run rates. Others are seeking to work down high inventory levels following large bulk purchases in the second quarter of the year.

Buyers are keeping a close eye on refinery run rates. With most major plant maintenance work over, supply is likely to be less tight over the coming months than in the first half of the year.

Europe base oil prices *$/t*



Forecasts of weaker crude values from the end of the year add to expectations of lower outright base oil prices. Crude prices are forecast to weaken as OPEC+ agrees to end its production cuts by September 2022.

There is also already a growing surplus of Group I base oils. Surplus supply is rising in neighboring regions like Russia and eastern Europe. Plants in these regions have been running at high rates after resuming operations in the second quarter following maintenance work. Supplies from those regions are being offered at increasingly competitive levels.

Supply for Group II and Group III base oils remains more limited for now. Surplus supply of Group III base oils especially remains tight. A heavy round of Group III plant maintenance work has ended. But supply remains limited among plants that have recently completed maintenance as they resume normal operations and rebuild their stocks.

Stagnant demand in overseas markets and the availability of more competitive supplies from other regional producers have added further downward pressure on European export and regional prices.

Demand remains more muted in Africa, Turkey, and India. More regions in Africa are struggling with renewed Covid-19-related restrictions and civil unrest. Demand in Latin

Europe

America remains strong. But higher freight rates and a shortage of containers are complicating the logistics of moving supplies to that region.

At the same time, supplies from Russia, the Mideast Gulf, and Asia-Pacific remain available at steep discounts to base oils of European origin.

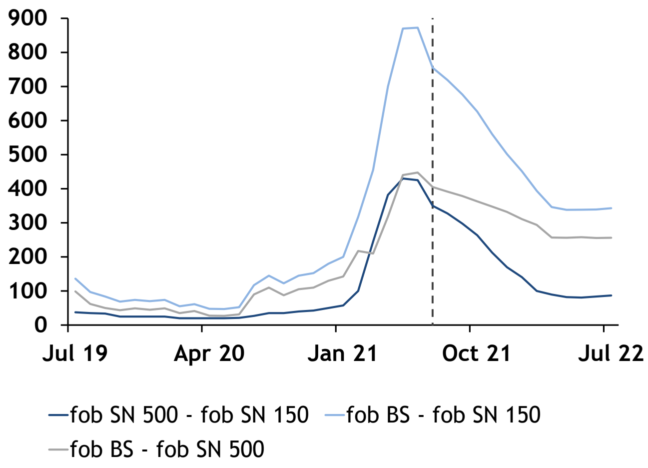
Europe Group I SN 150 prices are currently at a $340/t premium to Asia-Pacific Group I SN 150 fob export values. The premium has already fallen from $410/t the previous month. But it remains significantly higher than the historical average of $46/t since at least 2010.

Europe Group I SN 500 are at a $90/t premium to supplies from Asia-Pacific. European bright stock values are at a $205/t premium. These premiums have also fallen over the past month. But they remain much higher than usual.

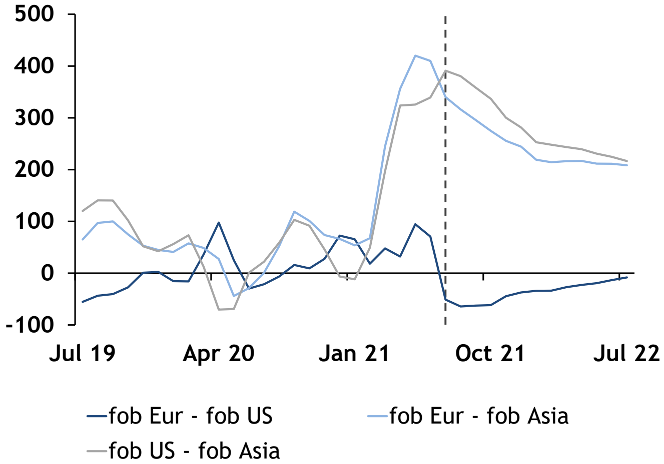
As mentioned in previous issues of the outlook, the availability of supplies from other regional producers at more competitive prices is set to put downward pressure on European base oil prices. This trend has started to materialize.

Those inter-regional spreads remain wider than usual. The wide spreads are likely to add to downward pressure on European Group I prices in the coming months.

Europe Group I spreads *$/t*



SN 150 arbitrage spreads *$/t*



The premium of Europe Group I SN 150 prices to Asia-Pacific supplies is forecast to fall to $208/t by the end of the forecast horizon. For Group I SN 500 values, the premium to supplies from Asia-Pacific is expected to fall to $3/t. For bright stock, the premium is forecast to fall to $1/t.

Improving supply availability for Group I base oils contrasts with still-tight availability of Group II supplies, especially for heavy grades. That trend is also likely to reverse over the coming months. Even with that correction, Group II prices are likely to remain firmer than usual relative to Group I base oils.

The Group II spread between heavy- and light-grade base oils has widened further to $342/t. The price spread is now at its highest level since at least mid-2013. The spread had averaged $90/t since that period.

The unusually wide spread reflects Europe's limited availability of Group II heavy-grade production and its reliance on overseas Group II producers for a large portion of those supplies. Light-grade base oils are also more readily available from overseas producers in the US and in Asia-Pacific.

The wide heavy-light premium is unlikely to persist at that level. The wider-than-usual spread between heavy and light grades will likely incentivize more production of the higher-priced product, at least in other regions. It also incentivizes

Europe

buyers to turn to using more Group I heavy neutrals. These are now at an unusually steep discount to Group II heavy grades. Moves like that are likely to pressure the Group II heavy-light grade spread closer to the historical average.

The premium of fca ARA Group II N600 to N150 is forecast to fall back to $123/t by the end of the forecast horizon.

The current shortage and high price of Group III base oils has added to demand for Group II base oils as an alternative. That support is likely to weaken as Group III availability improves and prices edge lower.

But the Group III premium to Group II is likely to remain wider than usual.

The EU Commission decided in July to cut the Group II base oil import quota to 75,000t for the first half of 2022. The quota will then be completely removed from the second half of 2022. The removal of the quota will increase import costs for supplies from the US.

The trend incentivizes buyers to use alternative Group II grades that are not impacted by the import quota. But imports from Asia-Pacific have mostly tended to be arbitrage shipments and consisted of smaller volumes. Rather, buyers are likely to have little choice but to absorb any additional cost of supplies from the US.

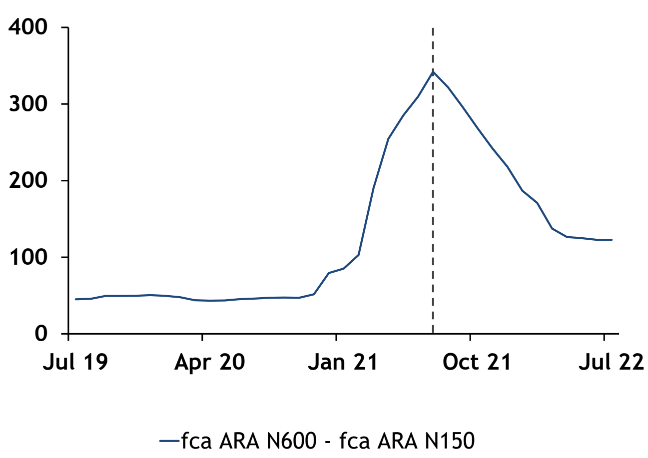
The trend could also incentivize blenders to revert back to using a combination of Group I and Group III base oils to produce a Group II equivalent. But that move is feasible only if the blenders have the flexibility to do so and if Group III supply and prices soften from current levels.

Record-high premiums of fca ARA Group II N150 to domestic Group I SN 150 values add to the attraction of such a move.

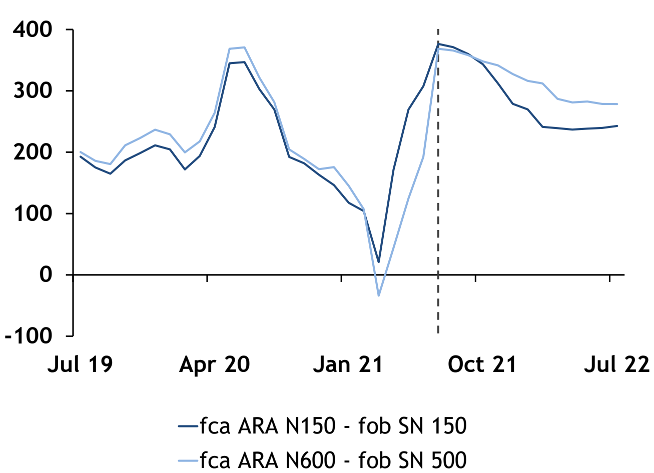
Such a possibility is forecast to materialize, especially for Group III (b) 4cst supplies - those without the full set of OEM approvals. Prices for these supplies are forecast to fall at a faster pace than Group II light grades over the coming months.

The premium of Group III (b) 4cst to fca ARA Group II N150 is forecast to slip to an average of $80/t during the forecast horizon, down from current levels of more than $90/t. Even so, the premium remains higher than its historical average of $40/t since early 2019.

Europe Group II spreads ***$/t***



Europe Group II - Group I spreads ***$/t***



Asia

July vs June forecast

July's base oil price forecast accounts for changes to the supply schedule, an updated regional crude and refined products forecast and an updated starting point. There are no major changes from June's issue of the outlook.

July forecast

Asia-Pacific Group I export base oil prices at the end of the forecast horizon in July next year are largely projected to be lower than prices at the start of the period in August next month. Group II prices are largely forecast to be higher at the end of the forecast horizon. Regional Group III prices are projected to be lower at the end of the period.

Base oil prices in the region are expected to trend lower in the upcoming months as demand ebbs and supply availability rises further.

More buyers throughout the region are holding back purchases or buying in smaller volumes. They are seeking to secure supplies only to sustain operations. The moves reflect expectations of further downward price adjustments and rising supply availability.

The moves also contrast with the intense competition between blenders earlier in the year as they struggled to secure sufficient supplies to cover their requirements.

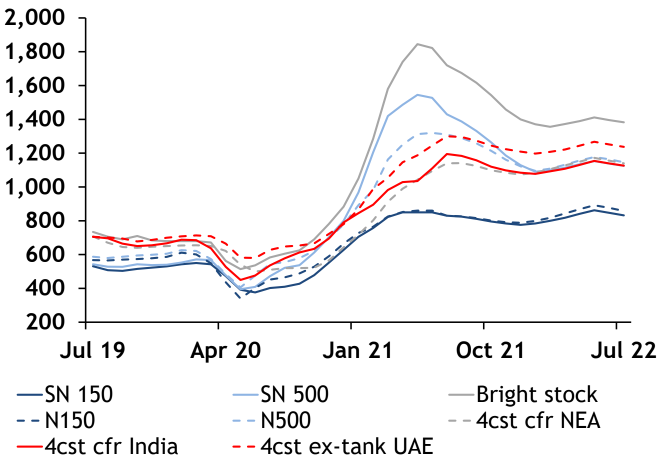
Continuing and tightened Covid-19 lockdowns in the region have also exacerbated a seasonal slowdown in demand during the third quarter.

Indian demand continues a cautious revival. Consumption slowed in the second quarter when lockdown measures curbed economic and transport activity. But market activity in that country remains weaker than usual as the country continues to manage the spread of Covid-19 infections. Monsoon rains have added to the slower demand.

Unlike last year, buyers also continued to take delivery of term supplies during the second quarter. There was no subsequent surge in demand in the third quarter to replenish low inventories.

Chinese demand remains firm for imported supplies of heavy grades. Imported supplies of light grades remain uncompetitive versus supplies from producers in China's domestic market.

Asia base oil prices **$/t**



But the price-gap has narrowed between imported base oils and supplies from domestic producers.

Domestic producers' prices have risen following plant shutdowns in China. The shutdowns have coincided with uncertainty about future supply availability and prices from domestic producers.

China's implementation of new taxes on imported road fuel blendstocks and cuts to crude import quotas have raised uncertainty about private-sector refinery run rates over the coming months. Chinese authorities are also enforcing tax rules more strictly.

Invoices describing products as white oils, liquid paraffins, or heat transfer fluids will also no longer be accepted as legal. Many base oil producers in the country sell supplies categorized as white oils and heat transfer fluids. Sold that way, the products have avoided the need to pay China's consumption tax.

Any move that makes domestic production in China less competitive is likely to boost demand for imports and slow the country's shift towards self-reliance. It also raises uncertainty about the sustainability of some current domestic production.

Rising supply availability in the region and more distant markets is set to compound the impact of the more muted

Asia

demand.

There are more signs of increasing production and rising availability. Supplies from Japan have increased following a drop in exports from that country in the second quarter of the year. More producers have available more surplus supply following a heavy round of plant maintenance work earlier in the year.

The combination of less-supportive demand and supply fundamentals are incentivizing more producers to clear more supplies to lock in prices at higher levels. Other producers are seeking to target alternative markets where prices are higher. There is also a marked slowdown in imported supplies from Europe.

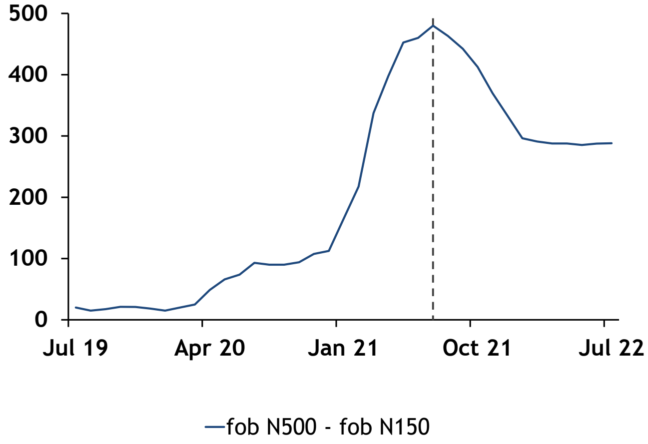
Some producers have begun tweaking output to produce more higher-priced products like heavy-grade base oils.

Prices for those grades have already begun to fall in response to easing supply-tightness. The trend is likely to continue.

Fob Asia Group I SN 500 prices are currently at a $600/t premium to Group I SN 150 values. The heavy-grade premium has fallen from $678/t the previous month to its narrowest in four months. Even so, it remains significantly higher than its historical average of $88/t since at least 2010.

Fob Asia Group II N500 prices similarly remain firmer than usual versus Group II N150 values. The Group II heavy-light grade spread is currently at $480/t. The spread is its highest on record. It had averaged $100/t since 2010.

Asia Group II spreads $/t



Higher-than-usual heavy-grade prices will likely prompt more refiners to produce more of the higher-priced product. With most maintenance work completed and supply availability rising, any such moves are increasingly attractive.

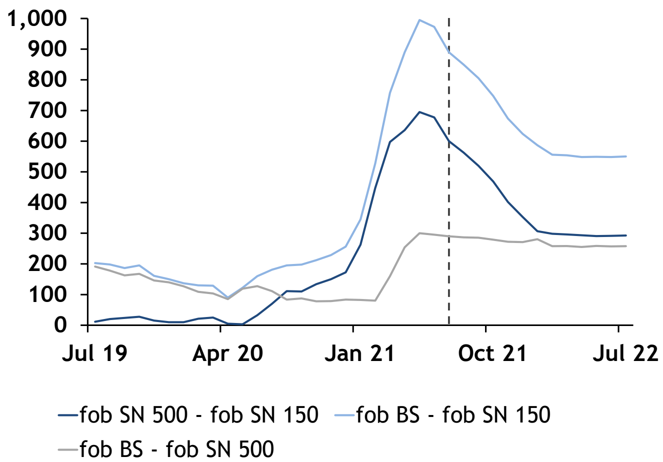
The Group I heavy-grade premium is forecast to fall to $292/t by the end of the forecast horizon. For Group II, the heavy-light grade spread is projected to fall to $288/t.

The smaller downward adjustment of the Group II heavy-light grade spread reflects firmer buying interest in Group II heavy grades in view of their lower prices compared with Group I base oils. They are also at steep discounts to Group II heavy-grade prices in Europe and US.

Fob Asia Group II N500 prices are currently at a $120/t discount to SN 500 values. The discount has fallen steadily since climbing to a record-high of $257/t in the first quarter of the year. Even so, the current discount remains an anomaly. Fob Asia Group II N500 prices have averaged a $42/t premium to SN 500 since at least 2010.

Some Group II producers have lowered prices because they are linked to published prices. Other producers have maintained offers at levels that are deemed high for the Asia market. But they have continued to attract buying interest in

Asia Group I spreads $/t



Asia

more distant markets. Group I SN 500 supplies are now unable to benefit from that kind of support.

Group II N500 prices are forecast to flip to a $22/t premium to Group I SN 500 values by the end of the forecast horizon.

Overseas demand remains strong in markets like Mideast Gulf, Europe and US.

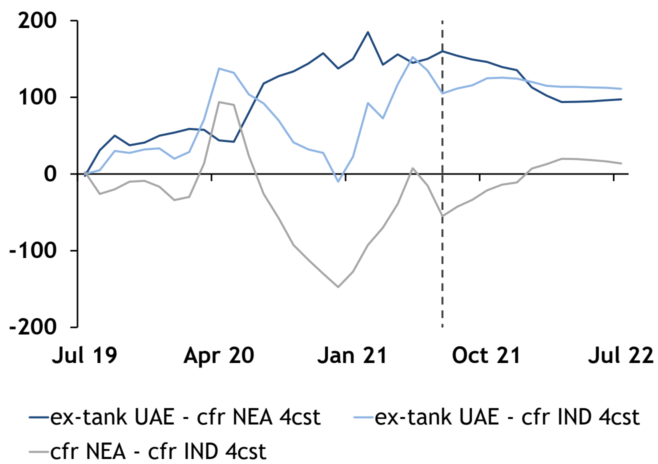
US Group II N600 prices are currently at a $436/t premium to fob Asia N500 values. The premium is at its highest level on record. The unusually wide spread boosts the prospect of more buyers in the Americas using supplies from Asia-Pacific. That prospect becomes more feasible as surplus heavy-grade supply increases.

Asia-Pacific Group III base oil prices are forecast to fall at a faster pace than regional Group II light-grade prices over the coming months. They are also set to fall at a slower pace than prices in other regions like the US.

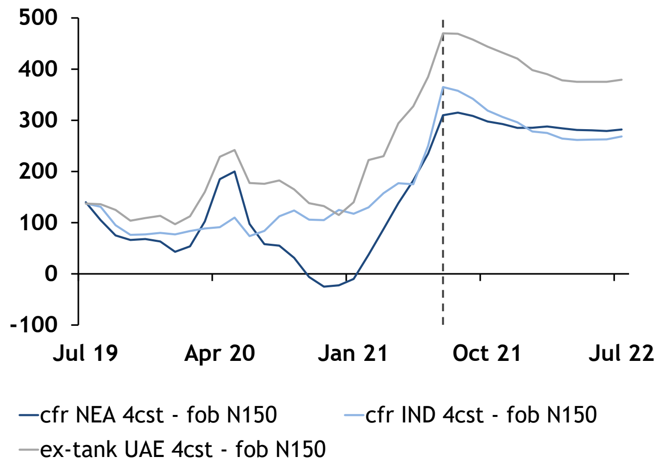
Supply-tightness is likely to ease following a protracted round of plant maintenance work in the region.

Availability of premium-grade base oils could also get a boost from new sources of supply within the region. Flexibag supplies are available from a refinery in south China. The quality of the supplies was deemed to be good. Unfamiliarity with the supplies and uncertainty about the reliability of the flow of supplies has dampened buying interest for now.

Asia Group III spreads *$/t*



Asia Group III - Group II spreads *$/t*



But significantly higher Group III prices in US and Europe will likely continue to attract more supplies to those markets.

Domestic US Group III 4cst prices are currently at a $860/t premium to Group III 4cst supplies delivered to northeast Asia (NEA). They are at a $805/t premium to cfr India Group III prices.

Domestic northwest Europe (NWE) Group III 4cst prices are at a $533/t premium to cfr NEA Group III 4cst prices. They are at a $478/t premium to cfr India prices.

The wider-than-usual spreads between regional prices are likely to sustain demand for supplies from Asia-Pacific. At the same time, producers are incentivized to move more supplies to those higher-priced markets. That combination of moves is likely to cap any surplus supply in the Asia-Pacific region and adjust regional price spreads closer to historical averages.

The premium of US domestic Group III 4cst prices to Group III 4cst cfr NEA values is forecast to fall back to $405/t by the end of the forecast horizon. Its premium to Group III 4cst cfr India prices is projected to fall to $419/t.

The premium of domestic NWE Group III 4cst prices to cfr NEA 4cst prices is forecast to narrow to $268/t. Its premium to cfr India Group III prices is expected to adjust down to $282/t by the end of the forecast horizon.

Maintenance and shutdowns

Upcoming / recent base oil plant maintenance / shutdowns / closures					
Refiner	**Location**	**Timing**	**Capacity**	**Capacity affected**	**Cause**
Eneos	Negishi, Japan	By Oct 2022	210,000 t/yr	All	Closure
Shell	Bukom, Singapore	July 2022	380,000 t/yr	All	Closure
Petronas	Melaka, Malaysia	Q1 2022	300,000 t/yr	NA	Maintenance
Tupras	Izmir, Turkey	4Q 2021 for 6 weeks	400,000 t/yr	All	Maintenance
Vertex Energy	Columbus, Ohio, US	4Q 2021 for 7 days	1,500 b/d	All, Group II	Maintenance
Sinopec	Gaoqiao, China	Oct to Nov 2021	600,000 t/yr	All, Group I/II	Maintenance
Rosneft	Angarsk, Russia	Aug or Sep 2021	250,000 t/yr	All	Maintenance
Formosa	Mailiao, Taiwan	Ely-Jul to End-Aug 2021	600,000 t/yr	All, Group II	Maintenance
Sapref	Durban, South Africa	Mid-Jul to Ely-Aug 2021	175,000 t/yr	All	Refinery maintenance
Panjin Northern Asphalt	Liaoning, China	Mid-Jul 2021 for 1 month	400,000 t/yr	All, Paraffinic	Maintenance
Shandong Jincheng/	Shandong, Zibo, China	Mid-Jul 2021 for 2 weeks	600,000 t/yr	All	Maintenance
Panjin Haoye	Liaoning, China	From Ely-Jul 2021	200,000 t/yr	All	Maintenance
Ilboc	Cartagena, Spain	Ely-Jun to Jul 2021	650,000 t/yr	All, Group II/III	Halt for expansion
Tatneft	Nizhnekamsk, Russia	2H Jun to 20 Jul 2021	186,000 t/yr	All	Maintenance
Hyundai-Shell	Daesan, South Korea	Jun to Jul 2021	800,000 t/yr	Partial	Run-cut
Valero	Three Rivers, Texas, US	From 06 Jun 2021	2,400 b/d	All, Naphthenic	Fire
Ergon	Newell, West Virginia, US	From 29 May 2021	4,800 b/d	All, Group I/II	Refinery fire
Rosneft	Ufa, Russia	2H May 2021 for 1 month	240,000 t/yr	All	Maintenance
Ningbo Bohui	Ningbo, China	2H May 2021 for 2 weeks	300,000 t/yr	All, Group II	Maintenance
Eneos	Kainan, Japan	10 May 2021 for 45 days	200,000 t/yr	NA	Maintenance
Sinopec	Maoming, China	May to Jun 2021	700,000 t/yr	57%, Grp II/III	Maintenance
Sapref	Durban, South Africa	May to mid-Jun 2021	175,000 t/yr	NA	Refinery maintenance
ENI	Livorno, Italy	Mid-May 2021 for 1 month	600,000 t/yr	All	Maintenance
MOL	Szazhalombatta, Hungary	May 2021 for 1 month	195,000 t/yr	All	Maintenance
Norinco Bora	Liaoning, Panjin, China	May 2021 for 1 month	300,000 t/yr	All, Group I	Maintenance
Vertex Energy	Columbus, Ohio, US	2Q or 3Q 2021 for 10 days	1,500 b/d	All, Group II	Maintenance
Jin Cheng	Shandong, Zibo, China	2H Apr 2021 for 2 weeks	500,000 t/yr	All, Group II	Maintenance
Jun Heng	Henan, Puyang, China	2H Apr 2021 for 2 weeks	200,000 t/yr	All, Group II	Maintenance
HuangHe New Materi-	Shandong, Zibo, China	2H Apr 2021 for 2 weeks	180,000 t/yr	All, Group II	Maintenance
Lotos	Gdansk, Poland	07 Apr to mid-May 2021	245,000 t/yr	All	Maintenance
PKN Orlen	Plock, Poland	Ely-Apr to 1H May 2021	160,000 t/yr	All	Maintenance
Naftan	Novopolotsk, Belarus	Apr 2021 for 1 month	200,000 t/yr	All	Maintenance
Total	Gonfreville, France	Apr 2021	240,000 t/yr	All	Closure after 2019 fire
Galp	Porto, Portugal	Apr 2021	180,000 t/yr	All	Closure
Ergon	Newell, West Virginia, US	09 Apr 2021 for 1 month	4,800 b/d	All, Group I/II	Maintenance
Neste	Porvoo, Finland	05 Apr to 2H Jun 2021	250,000 t/yr	All, Group III	Maintenance
Lukoil	Perm, Russia	2Q 2021	460,000 t/yr	All	Maintenance
Eneos	Wakayama, Japan	29 Mar to 2H May 2021	360,000 t/yr	All	Refinery fire
SK Lubricants	Ulsan, South Korea	2H Mar to end-Jun 2021	26,000 b/d	Partial, Grp III	Maintenance
GS Caltex	Yeosu, South Korea	Mid-Mar 2021 for 35-40 days	23,000 b/d	NA	Refinery maintenance
Avista Oil	Peachtree City, Georgia, US	07-12 Mar 2021	1,250 b/d	All, Group II	Maintenance
HPCL	Mumbai, India	Ely-Mar to 30 May 2021	480,000 t/yr	Partial	Refinery maintenance
IRPC	Rayong, Thailand	Ely-Mar to 09 Apr 2021	320,000 t/yr	Partial	Maintenance
Cross Oil	Smackover, Arkansas, US	Mar 2021 for 21 days	5,000 b/d	All	Maintenance
Rosneft/Gazpromneft	Yaroslavl, Russia	End-Feb to end-Mar 2021	350,000 t/yr	250kt/yr Group I	Maintenance
HCC	Indianapolis, Indiana, US	End-Feb to Ely-Mar 2021	2,500 b/d	All, Group II	Maintenance
Sinopec	Jinan, China	Late-Feb to end-Apr 2021	150,000 t/yr	All	Maintenance
Gazpromneft	Omsk, Russia	Mid-Feb 2021 for 1 month	230,000 t/yr	All	Maintenance

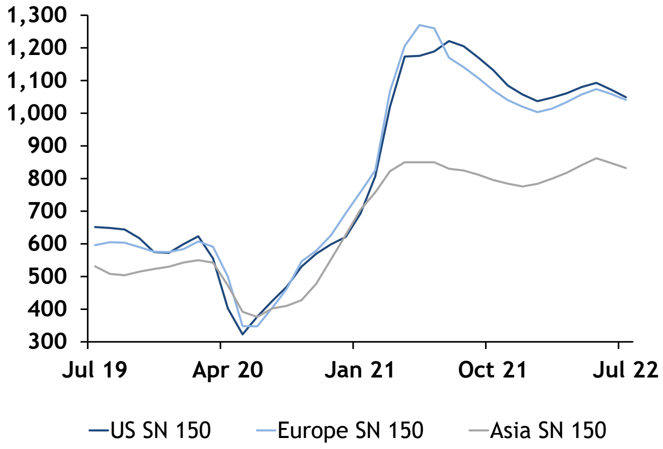
Every effort has been made to verify information directly with appropriate company sources. Some information has been obtained from usually reliable sources, but cannot be officially confirmed with the refinery concerned. The list will be updated when new information becomes available.

Market fundamentals

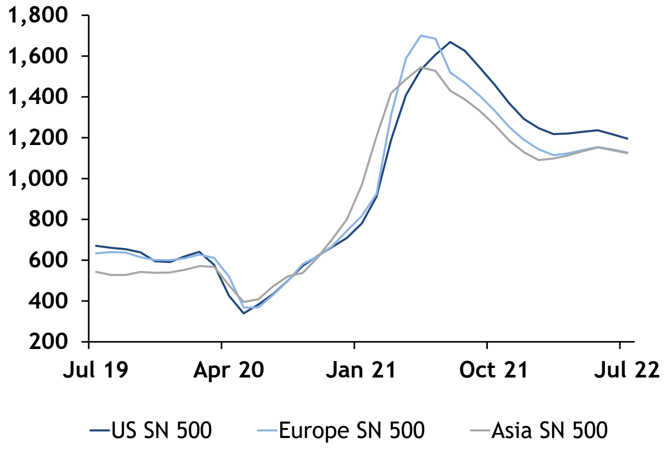
Upcoming / recent expansions / conversions / new plants					
Refiner	**Location**	**Timing**	**New capacity**	**Grade**	**Expansion / new plant**
IOC	Haldia, India	NA	270,000 t/yr	Group III	New
IOC	Koyali, Gujarat, India	NA	235,000 t/yr	NA	New
Modrica refinery	Modrica, Bosnia	NA	200,000 t/yr	Group III	Expansion
NA	Southeast Asia	NA	Up to 300,000 t/yr	Group II N150, N500	New
Saudi Aramco/Sabic	Yanbu, Saudi Arabia	2025	NA	NA	New
IOC	Panipat, Delhi, India	2024	NA	Group III	New
ExxonMobil	Jurong, Singapore	2023	1mn t/yr	Group II N150, N600, high-vis base oils	New
Avista Green	Dollbergen, Germany	After 2022	10-15pc higher	Group I+ re-refinery	New
Hainan Handi	Hainan, China	2022	300,000 t/yr	Group II re-refinery	New
Gazpromneft	Omsk, Russia	2021-2022	220,000 t/yr	Group II/III 2cst, 4cst, 6cst and 8cst	Expansion
Avista Green	Kalundborg, Denmark	End-2021	10-15pc higher	Group I+ re-refinery	Expansion
CNOOC/Bora Petchem	Liaoning, China	End-2021	1.2mn t/yr	Naphthenic	Expansion
BPCL	Mumbai, India	Oct 2021	450,000 t/yr	Group II N65, N150, N500, Group III 8cst	Expansion
Hainan Handi Sunshine	Hainan, Yangpu, China	3Q 2021	Up to 800,000 t/yr	Group II+/III	New
Ilboc (Sk-Repsol)	Cartagena, Spain	2H 2021	Up to 50pc higher	Group II/III	Expansion
Sinopec	Yanshan, China	Jun-Jul 2021	250,000 t/yr	Group II	Expansion
Tayras	Selimiye, Turkey	Mid-2021	40,000 t/yr	Group II+ re-refinery, N70, N110, N220	New
Panjin Haoye	Liaoning, China	Apr 2021	200,000 t/yr	Group II N100, N150 and N350	New
Lukoil	Volgograd, Russia	Feb 2021	NA	Group II	New
Qinghe Petrochemical	Shandong, China	Jun 2020	600,000 t/yr	Group III/II	New
Ningbo Bohui	Zhejiang, China	2Q 2020	300,000 t/yr	Group II	New
Gen III Oil Corporation	Bowden, Canada	2Q 2020	2,240 b/d	700 b/d Group II, 1,540 b/d Group III	New
HILL	Chimkent, Kazakhstan	2020	250,000 t/yr	Group I/II/III	New
Liaohe Petrochemical	Liaoning, China	4Q 2019	400,000 t/yr	Naphthenic base oils	New
Sinopec	Jingmen, China	End-Oct 2019	550,000 t/yr	Group II heavy and white oils	New
Petrochina	Karamay, China	Oct 2019	30,000 t/yr each	Naphthenic bright stock, rubber oil	Expansion
Neste	California, US	3Q 2019	NA	Group III	Conversion
ExxonMobil	Jurong, Singapore	2Q 2019	100,000 t/yr	Group II	Expansion
Hengli Petrochemical	Dalian, China	Apr 2019	600,000 t/yr	Group II and III	New
ExxonMobil	Rotterdam, Netherlands	1Q 2019	900,000 t/yr	Group II	New
Puraglobe	Tampa, US	1Q 2019	50,000 t/yr	Group III	New
Henan Junheng	Henan, China	1Q 2019	400,000 t/yr	Group II	New
Lub-rref Bangladesh Ltd	Chittagong, Bangladesh	1Q 2019	50,000 t/yr	Group II N70, N150, N500/600 re-refinery	New
Shandong Qingyuan	Shandong, China	1Q 2019	800,000 t/yr	Group II+/III	New
Shandong Huanghe	Shandong, China	1Q 2019	180,000 t/yr	White oils and base oils, Group II	New
Shanxi Lu'an Taihang	Shanxi, China	1Q 2019	Up to 600,000 t/yr	Group III+ CTL, 2/3/4/8cst	New
Shida Changsheng	Shandong, China	Jan 2019	300,000 t/yr	Group II	New
VN Oil	Hiep Phuoc, Vietnam	After 2018	50,000 t/yr	Group II re-refinery	Cancelled
Liaoning Haihua	Liaoning, China	Dec 2018	300,000 t/yr	Naphthenic/paraffinic base oils, Group II	New
Luberef	Yanbu, Saudi Arabia	End-Dec	170,000 t/yr	Group I bright stock	Expansion
Hyundai-Shell	Daesan, South Korea	3Q 2018	200,000 t/yr	Group II	Expansion
Pemex	Salamanca, Mexico	2018	3,300 b/d	Group II	Delayed
Holly Frontier	Wood Cross, US	2018	10,000-12,000 b/d	Group III	Delayed
Luberef	Yanbu, Saudi Arabia	4Q 2017	715,000 t/yr	Group II	New
Panjin Northern Asphalt	Liaoning, China	2H Nov 2017	300,000 t/yr	Naphthenic base oils	New
Slavneft	Yaroslavl, Russia	2Q 2017	100,000 t/yr	Group III	New
Petrobras	Comperj, Brazil	2017	355,000 t/yr	Group II	Cancelled
S-Oil	Onsan, South Korea	Dec 2016	200,000 t/yr	Group II N500	Conversion

Every effort has been made to verify information directly with appropriate company sources. The list will be updated when new information becomes available.

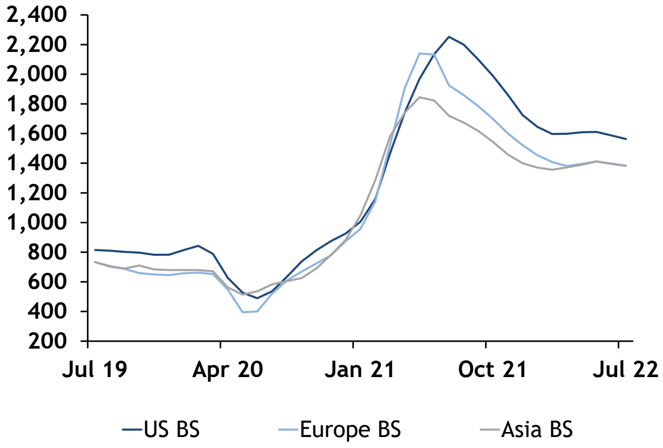
Group I SN 150 fob export $/t



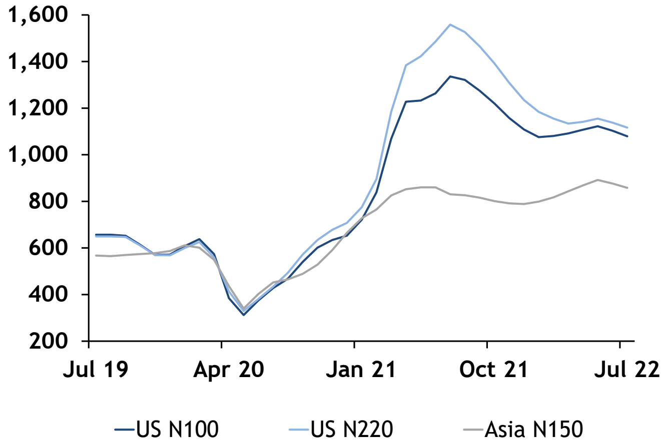
Group I SN 500 fob export $/t



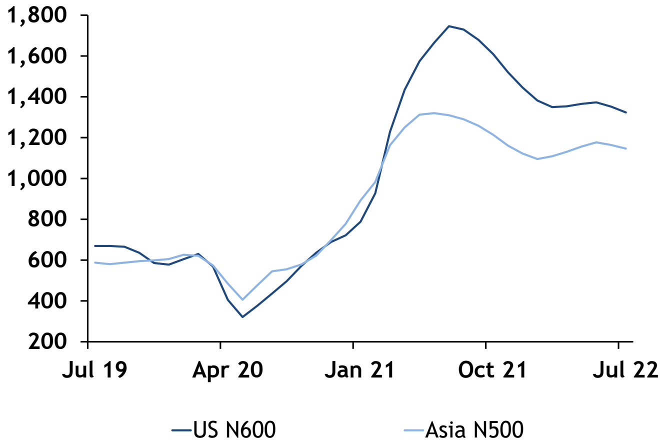
Group I bright stock fob export $/t



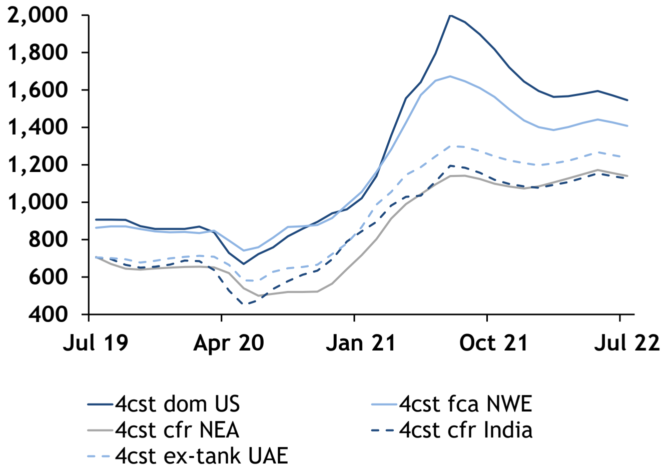
Group II N100 & N150 & N220 fob export $/t



Group II N500 & N600 fob export $/t



Group III 4cst $/t



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