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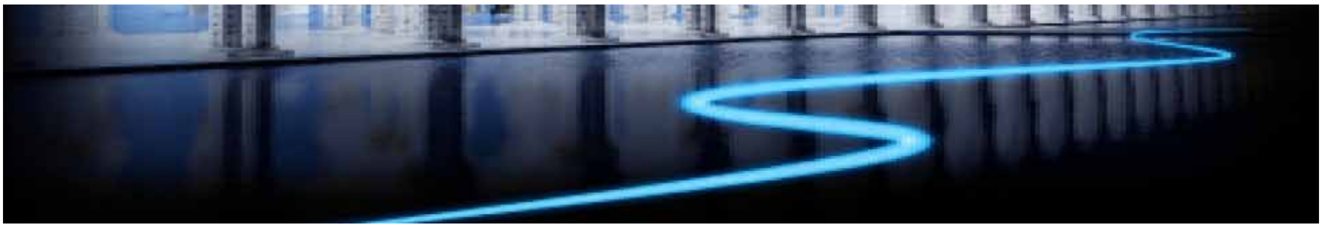
Argus Base Oils Outlook



Overview

Americas	Europe	Asia-Pacific
US light, sweet crude oil exports rise, pressures base oil margins	European Group I prices rise versus Asian supplies	Lower Asian base oil prices highlight region's access to competitively-priced crude
Automotive strike action to curb base oil, lubricant demand	European Group II imports slow as arbitrage narrows, regional prices rise	Muted Chinese demand continues to weigh on heavy-grade prices in the region
Group II domestic-export spreads narrow, remains significantly higher than usual	Premium of Group III supplies with full set of OEM approvals surges to record-high	Premium of Group III over Group II values drop as supply fundamentals diverge

Short-term price drivers

	Support	Pressure
Fundamentals	Extended crude oil production cuts to increase cost of base oils production from the baseline	Base oil and lubricant consumption remains weaker than usual, faces seasonal slowdown
	Firm gasoil, diesel values incentivise refiners to optimise production streams, cut base oils production	Demand for Group III supplies remain curbed as low Group II prices incentivise more use of those base oils
	Ongoing plant maintenances in Asia, Americas curb supply availability	
Sentiment	End of monsoon season to spur market activity in India, Thailand	Prices to face pressure in absence of weather-related disruptions and as market participants clear inventories for year-end tax purposes
	Prolonged supply tightness as more refineries cut base oil production runs	Demand set to wane further amid seasonal slowdown in the western hemisphere
Macroeconomics	Chinese industrial production in August rose from month- and year-ago levels, PMI data signalling an expansion in the sector	New manufacturing orders extends decline in the Euro-zone, sector in deep contractionary territory
	Low inflation rates in China contrast most of Asia, Europe, Americas, suggests more room for expansionary policies	Flash US Manufacturing PMI edged up to 48.9 in September, remains in contractionary territory

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Base oil price forecast												$/t
	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24	Jul 24	Aug 24	Sep 24
US												
Group I												
SN 150 fob export	913	895	869	878	895	918	947	962	970	961	938	922
SN 500 fob export	1082	1054	1016	995	1005	1024	1054	1076	1090	1078	1062	1049
Bright stock fob export	1304	1272	1234	1212	1227	1249	1278	1298	1306	1290	1266	1247
SN 150 domestic	1044	1016	980	962	957	976	1001	1018	1029	1018	995	976
SN 500 domestic	1423	1376	1320	1271	1243	1254	1276	1294	1306	1283	1256	1220
Bright stock domestic	1709	1647	1571	1517	1490	1502	1525	1542	1552	1531	1503	1469
Group II												
N100 fob export	986	961	927	902	916	939	970	991	1003	988	963	935
N220 fob export	963	947	921	919	935	956	984	1006	1022	1006	982	955
N600 fob export	1154	1122	1082	1058	1066	1080	1109	1132	1147	1147	1127	1100
N100 domestic	1136	1098	1045	1009	981	1000	1025	1044	1056	1036	1009	986
N220 domestic	1141	1113	1071	1031	1007	1026	1053	1073	1088	1064	1034	1003
N600 domestic	1621	1555	1473	1413	1387	1396	1412	1434	1448	1427	1395	1355
Group III												
4cst domestic	1690	1646	1588	1550	1534	1551	1576	1596	1607	1621	1606	1587
Europe												
Group I												
SN 150 fob export	990	965	928	906	916	935	960	977	986	974	950	924
SN 500 fob export	1071	1040	998	976	986	1009	1036	1055	1066	1050	1029	1000
Bright stock fob export	1265	1235	1193	1171	1178	1190	1211	1229	1233	1215	1191	1161
SN 150 domestic	1068	1044	1014	1000	1010	1026	1050	1065	1070	1051	1028	997
SN 500 domestic	1147	1122	1092	1074	1084	1101	1127	1144	1152	1135	1110	1084
Bright stock domestic	1379	1347	1307	1281	1262	1276	1296	1308	1316	1300	1278	1251
Group II												
N150 fca ARA	1194	1164	1120	1099	1103	1119	1141	1158	1169	1154	1126	1094
N600 fca ARA	1311	1282	1244	1222	1226	1242	1262	1281	1292	1273	1248	1218
Group III												
4cst fca NWE	1732	1671	1624	1599	1611	1624	1644	1654	1657	1640	1617	1588
(a) 4cst fca NWE	1932	1883	1826	1788	1770	1785	1805	1816	1822	1807	1784	1756
(b) 4cst fca NWE	1535	1503	1478	1465	1479	1497	1518	1529	1535	1520	1501	1475
Asia												
Group I												
SN 150 fob export	804	791	776	771	791	819	844	860	857	847	833	827
SN 500 fob export	918	906	885	878	898	926	951	963	959	948	931	909
Bright stock fob export	1039	1042	1029	1047	1074	1109	1129	1145	1143	1132	1113	1094
Group II												
N150 fob export	932	918	896	882	897	920	941	950	944	927	903	886
N500 fob export	947	935	914	915	933	965	994	1010	1012	1002	982	967
N70 cfr India	1007	988	963	949	960	983	1002	1007	1003	989	968	942
N150 cfr India	981	967	948	937	954	979	1000	1011	1002	990	972	953
N500 cfr India	1001	988	968	966	984	1012	1046	1065	1060	1047	1027	1013
Group III												
4cst cfr Northeast Asia	1221	1194	1160	1141	1155	1178	1196	1205	1195	1179	1154	1135
4cst cfr India	1202	1174	1139	1113	1125	1147	1167	1179	1176	1158	1134	1122
4cst ex-tank UAE	1307	1279	1247	1225	1237	1254	1276	1284	1275	1261	1242	1218

Summary

The month ahead:

Base oil prices are largely forecast to be higher in the month ahead.

Rising feedstock and competing fuel values and relatively limited supply availability has countered the price pressure from slower demand for this time of year.

In Asia, demand is showing firmer signs of a revival. Some buyers have resumed purchases amid expectations of rising prices and more limited spot supply. In Europe, demand remains lacklustre. Demand in key export outlets like Turkey and West Africa remains slow. Premium-grade supply availability is increasingly plentiful following an influx of supplies. In the US, lubricant consumption faces a seasonal slowdown. But several producers have raised posted prices as base oil margins drop.

The next 3-6 months:

Base oil prices in March 2024 are generally forecast to be lower than prices in October next month.

An expected rise in supply availability is set to outweigh the price pressure from rising demand as the spring oil-change season approaches. A relatively light round of scheduled plant maintenances will likely add onto a supply overhang.

There is more price support for Asian base oils. Demand in the region typically rises after the lunar new year holidays. Base oils in the region are also priced at some of the lowest levels globally. Prices for Asian heavy-grade supplies are especially weak, highlighting muted market activity in China and producers' access to competitively-priced crude slates.

A wide arbitrage boosts the attractiveness of importing more cargo from Asia, and for Asian producers to divert more supplies into key export outlets. Such moves have already materialised and have curbed a supply overhang in the region.

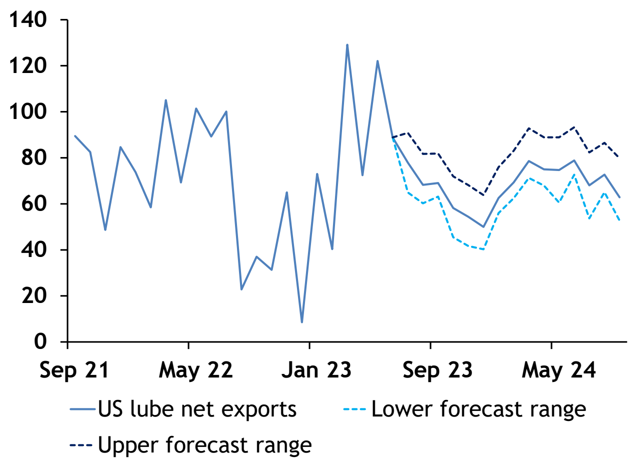
Longer term:

Base oil prices at the end of the forecast horizon in September 2024 are largely forecast to be lower compared with prices at the start of the period in October 2023.

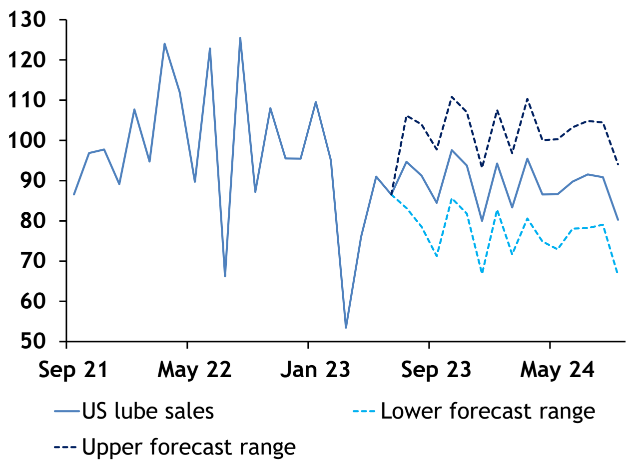
A slowdown in seasonal demand from mid-year is set to exacerbate the price pressure from an expected rise in supply availability. A structural rise in premium-grade base oils production capacity in recent years has yet to be fully reflected. Most new plants have yet to run at optimal rates. Other refineries typically require a period of time to optimise production and the quality of their base oils.

An expected rise in net exports from Asia is set to weigh on global base oil prices. Asia now accounts for about 45pc of the world's base oils production capacity. In US and Europe, domestic prices remain high versus export values. Regional producers will likely be pressured to lower their prices to remain competitive and to maintain market share in their respective regions.

US net exports (Base = 2017)



US lubricant sales (Base = 2017)



US

September forecast

US Group I base oil prices at the end of the forecast horizon in September 2024 are generally forecast to be lower than prices at the start of the period in October 2023. US Group II and Group III base oil values are also largely projected to be lower at the end of the forecast horizon than at the start of the period.

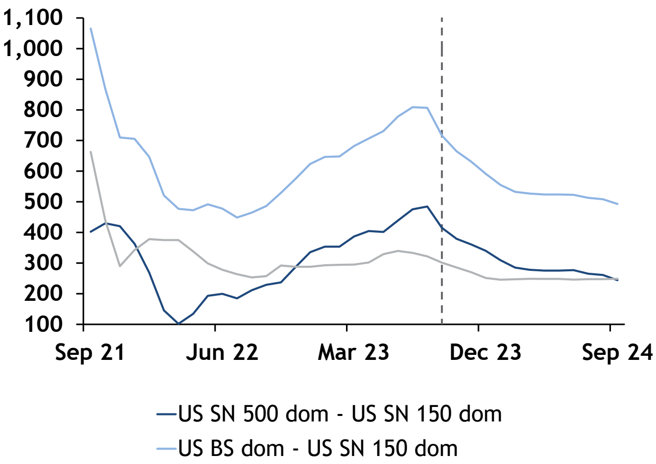
Base oil prices in the region are generally forecast to extend their rise in the month ahead before trending lower for the rest of the year. A seasonal rise in demand is then set to provide some support to prices from the start of 2024.

Demand for the lubricant feedstock remains steady-to-soft. Flash US Manufacturing PMI came in at 48.9 for September, signalling a contraction in the sector that is weighed by a decline in new orders.

Some buyers have begun restocking base oils and finished lubricants as inventories run low. Rising crude and diesel values have also prompted several blenders to lock in supplies at current price levels. Demand is firmer among blenders that have the flexibility to raise finished lubricant prices to pass on higher base oil posted prices that came into effect in August.

Firm import demand from Brazil and Mexico has provided some support to US base oil values. Finished lubricant demand has risen alongside rising economic activity. Brazilian demand has held firm as domestic output remains curtailed by supply disruptions. Demand for light-grade base oils has also risen in Mexico for its use as a fuel extender, even if bids are deemed too low.

US domestic Group I spreads *$/t*



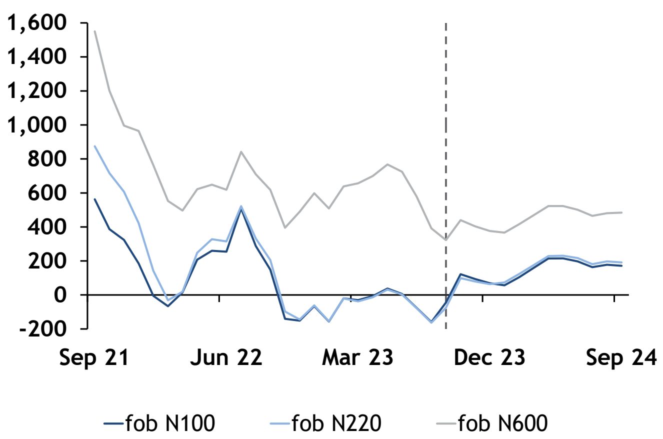
Even so, there remains widespread expectations of lower prices for the rest of the year.

Demand typically faces a seasonal slowdown from mid-year. Market participants also typically clear inventories by year-end for tax-related purposes. The absence of any weather-related disruptions from the Atlantic hurricane season will likely boost supply availability further as stocks that were held back as a buffer are released for use. These expectations have spurred some buyers to hold back purchases to limit their exposure to any price drop.

Strikes at several automotive plants, include plants in Michigan, Ohio and Missouri is also set to weigh on engine oil demand at the factory fill point. A prolonged or more widespread strike action will likely curb demand further and limit the size of any price rise in the month ahead.

Base oil prices continue to be supported by firmer crude and diesel values. Several key producers in the region have risen their posted prices in September amid rising costs for base oils production. Spot supply availability is also tighter as

US Group II spread to diesel *$/t*



US

refiners optimise their output streams and as prices in export markets rise. These factors continue to counter steady-to-soft demand in the US.

Feedstock values pressure Group II base oils

Higher feedstock and diesel values have had more impact on Group II prices, especially those with a lower viscosity. The price pressure on Group II base oils also reflects a larger share of Group II base oils production in the US.

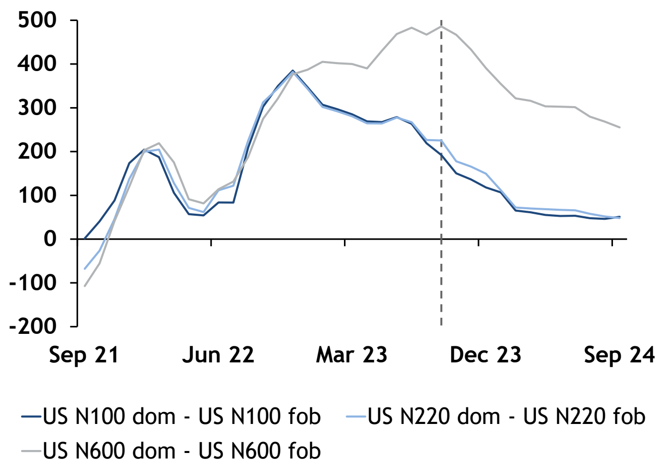
US Group II N100 fob export values are currently at a $83/t premium to US Group II SN 150 fob export prices. The premium is more than three times higher the historical average of $24/t since at least 2010.

The premium of US Group II N600 fob export values to US Group II SN 500 fob export prices has risen to $91/t. But the premium is only marginally higher than historical average of $79/t since 2010.

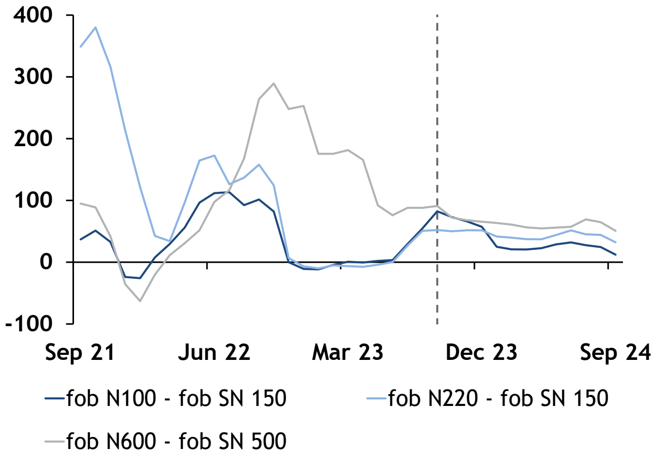
Premium, light-grade base oils are a closer substitute for alternative fuels production. A wider spread between Group II N100 and Group I SN 150 reflects more limited availability for Group II supplies.

It also reflects firmer interest for premium, light-grade supplies in key outlets like Mexico. Weaker-than-usual base oil values to diesel prices incentivises the usage of light-grade base oils as a fuel extender.

US Group II domestic-export spreads $/t



US Group II - Group I spreads $/t



By contrast, relatively narrow Group II N600 and Group I SN 500 spreads reflect firmer heavy-grade demand and more limited supply availability. Supply disruptions in Brazil have boosted demand for heavy-grade base oils especially. Supply for heavy-grade base oils is also typically more limited than light-grade supplies because of the crude slate used.

The premium of Group II to Group I supplies is forecast to narrow in the months ahead. A US Group I refinery will begin its 45-day maintenance from end-September. A Group I producer in Brazil will also be having a scheduled turnaround in October. These supply disruptions are expected to curb Group I supply availability and provide some support to prices.

At the same time, US Group II heavy grades remain at a steep premium to overseas supplies. Such a trend will likely curb demand for US base oils. Some volumes of Asian base oils have already been diverted towards US and Latin America. More such moves would add onto the price pressure.

The premium of US Group II N100 to US Group II SN 150 fob export prices is forecast to drop to $12/t by the end of the forecast period. The premium of US Group II N600 to US Group II SN 500 fob export values is forecast to drop to $32/t by the end of the same period.

US

Domestic-export spreads narrow but remain wide

Rising feedstock and competing fuel values also had more impact on Group II export prices than on their domestic values.

US domestic Group II values are currently at a $301/t premium on average to Group II fob export prices. The premium is at its lowest in a year. But it remains significantly higher than historical averages of $69/t since at least 2011.

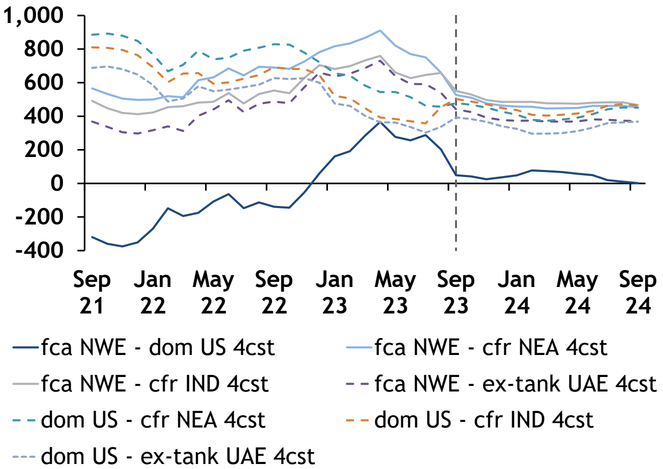
While domestic-export spreads are wide for all Group II grades, they are especially wide for Group II N600. The trend reflects more limited availability for heavy-grade base oils. The yield for Group II heavy-grade base oils is typically lesser than for light-grade supplies. Any refinery optimisation would curb Group II heavy-grade availability further.

Wide domestic-export spreads also reflect differing fundamentals in domestic and export markets. Export prices continue to be pressured by more competitive volumes from Asia. Producers also typically opt to keep domestic prices firm by clearing surplus volumes into the export markets.

A wide domestic-export spread for Group II base oils is not expected to persist. Several producers have already begun diverting more supplies towards the domestic market. Blenders in the region are also incentivised to seek more supplies from alternative sources. Any rise in demand in key export outlets is also expected to provide support to fob export prices from the US.

The average premium of US domestic Group II to Group II fob export values is forecast to drop to $118/t by the end of the forecast period. Even at those levels, they remain higher than historical averages.

Group III 4cst arbitrage spreads *$/t*



US-Europe Group III spreads narrow

While Group I and Group II values have risen, Group III prices have held relatively steady. Steadier Group III prices in the US also contrast a sharp drop in European Group III values.

US domestic Group III 4cst prices are currently at a $49/t discount to fca northwest Europe (NWE) Group III 4cst values. The discount is at its lowest for the year. But current discounts contrast a typical premium of $23/t since at least 2010.

Group III values in Europe have largely been pressured by the influx of overseas volumes and especially supplies without the full set of OEM approvals. European Group III prices have been the highest globally since the start of the year. This has boosted the attractiveness of moving surplus volumes towards that region. Group III supply is now plentiful in Europe.

Higher Group III base oil prices in Europe are unreflective of historical trends and the share of Group III base oils production capacity in each region. Group III production makes up about 15pc of Europe's nameplate production capacity. By contrast, Group III production makes up about 3pc of US's nameplate production capacity.

A growing surplus in Europe and still-muted demand for the premium grade will likely add downward price pressure to Group III supplies in that region. Producers in Asia and the Mideast Gulf have also opted to keep US domestic prices firm by diverting surplus volumes into other markets.

The discount of US domestic Group III 4cst prices to fca NWE Group III 4cst values is forecast to drop to $2/t by the end of the forecast period.

Europe

September forecast

European Group I base oil prices at the end of the forecast horizon in September 2024 are forecast to be lower than prices at the start of the period in October 2023. Fca Antwerp-Rotterdam-Amsterdam (ARA) Group II and fca domestic northwest Europe (NWE) Group III prices are also projected to be lower.

The price trends for European base oils is mixed for the rest of 2023. European Group I fob export prices are set to edge higher in the month ahead before trending lower for the rest of 2023. Group I domestic values, Group II, and Group III prices are forecast to trend lower till at least year-end. European base oil prices are then forecast to trend higher in the first half of 2024 as the spring oil-change season approaches.

Rising crude and feedstock values continue to pressure base oil prices from the baseline. This is boosting the cost of producing Group I base oils especially. Group I base oils make up close to three-quarter of Europe's base oils nameplate production capacity. Some Group I prices remain at a discount to regional gasoil and diesel values.

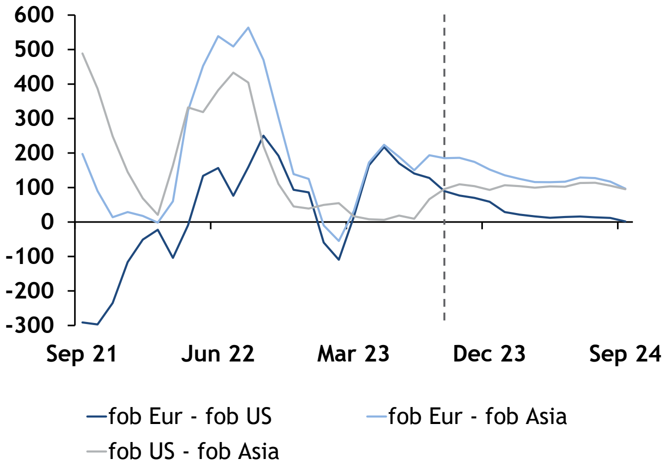
Group I supply is also more limited in the region. Some refiners have begun prioritising diesel output. A central European refinery is offering limited base oil volumes following its maintenance. Russian domestic demand is also firmer. This has curbed availability in the Baltic and Black Sea and in several key export outlets.

Supply of premium-grade base oils is more plentiful. Persistently high Group II and Group III prices in the region have incentivised a slew of arbitrage cargoes to Europe in recent months. Several premium-grade producers have issued discounts to clear a persistent surplus as sales drop significantly from year-ago levels.

While supply availability is mixed, demand continues to be muted. Flash Eurozone Manufacturing PMI came in at 43.4 for September, highlighting a sharp contraction in manufacturing activity in countries like Germany and France.

Finished lubricant inventories are also largely healthy. Other buyers have opted to assess existing base oil inventories before issuing orders.

SN 150 arbitrage spreads $/t



Demand in key export outlets is also lacklustre. Nigerian driving activity has slowed following the removal of fuel subsidies. A prolonged rainy season in west Africa is disrupting distribution networks and exacerbating a base oil supply overhang in that region. Banks also remain reluctant to extend lines of credit as the local currency depreciates against the US dollar.

In Turkey, buyers continue to opt for Russian supplies. But blenders are in little urgency to secure additional spot volumes as inventories remain ample. Banks in the country are also limiting loans because of hyperinflation and fears of insolvency. A slowdown in lubricant additive sales highlight waning interest to blend finished lubricants.

European Grp I prices rise versus Asian supplies

The rise in Group I values is largely supply driven. A shortage of gasoil in Europe has prompted more refineries to produce the fuel instead of base oils. This has exacerbated the price pressure from more limited production and has boosted the opportunity cost of producing base oils.

European base oil prices have also been some of the highest globally since sanctions were placed on Russian oil products in February 2023. By contrast, imports of Russian oil products have risen in other regions. The result is a wider spread between European and Asian Group I base oil prices.

Europe

Europe Group I SN 150 fob export prices are currently at a $185/t premium to Asia Group I SN 150 fob export values. Current premiums are more than two times higher than historical averages of $72/t since at least 2010.

Europe Group I SN 500 fob export values are at a $155/t premium to fob export supplies from Asia. The premium is starkly higher than historical averages of less than $50/t since at least 2010.

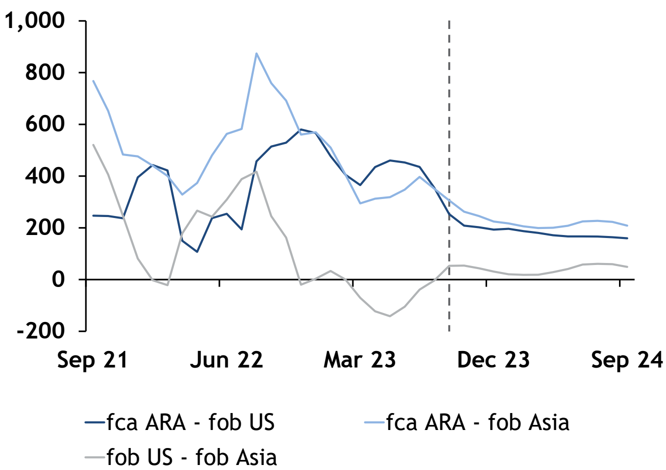
The premium of European Group I supplies is expected to drop in the months ahead. Higher-than-usual European Group I prices would prompt more regional buyers to seek alternative supplies. At the same time, Asian Group I supply is set to be increasingly limited as several Group I refiners in the region undergo scheduled maintenance. A Group I plant is also expected to shut permanently by October. Any rise in Asian demand following the monsoon season will likely provide an additional boost to prices.

The premium of Europe Group I SN 150 fob export prices to Asia Group I SN 150 fob export prices is forecast to drop to $97/t by the end of the forecast period. The premium of Europe Group I SN 500 fob export prices to Asian supplies is projected to fall to $91/t by the end of the same period.

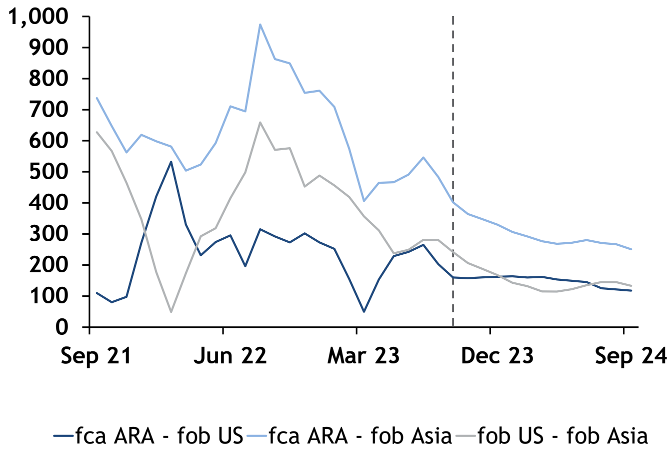
Arbitrage diverges for Grp II light, heavy grades

While European Group I prices have risen relative to Asian supplies, Group II values in the region have held steadier. The European market is a net importer of Group II base oils.

Group II (N100/N150) Light-Grade spreads *$/t*



Group II Heavy-Grade spreads *$/t*



Fca ARA Group II N150 prices are at a $253/t and $306/t premium to US Group II N100 and Asia Group II N150 fob export values, respectively. The premium to US Group II light-grade supplies is higher than historical averages of $224/t since mid-2013. The European price premium to Asian supplies is closer to historical averages of $263/t since that period.

Fca ARA Group II N600 prices are at a $160/t and $402/t premium to US Group II N600 and Asia Group II N500 fob export values, respectively. The premium to US Group II heavy-grade supplies is more reflective of historical averages of $154/t since mid-2013. The European price premium to Asian supplies is significantly higher than historical averages of $276/t since that period.

While European Group II price premiums remain higher than usual, they have been on the decline since around mid-year. European demand for the premium grade has ebbed as prices were deemed too high relative to Group I base oils. More overseas cargoes have also been shipped to Europe, adding to rising inventory levels in the region.

The trend also highlights the attractiveness of US light-grade supplies and Asia heavy-grade supplies, should European buyers have the flexibility to use base oils from alternative sources.

Europe

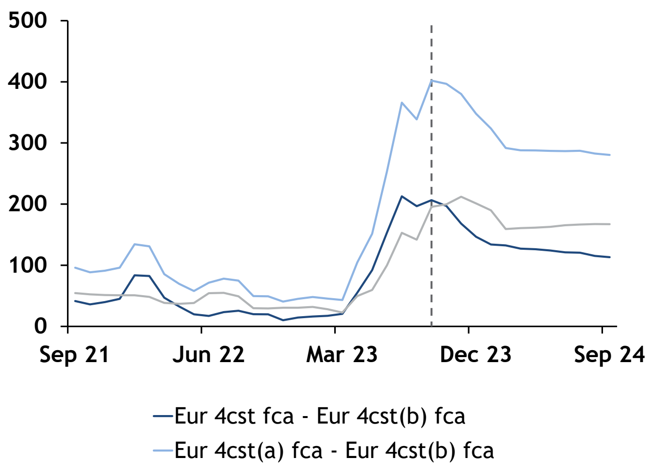
Muted Chinese demand has boosted the availability of heavy-grade supplies in Asia. Premium, light-grade supplies are more limited as more Asian refiners optimise their output streams amid unusually weak base oil margins. Some buyers in Asia have also utilised light-grade base oils as a fuel extender.

By contrast, demand for grades with a higher viscosity is relatively firmer in the US. Supply disruptions in Latin America have continued to boost interest in US heavy-grade supplies. Any refinery optimisation or base oil production cuts also typically has a larger price impact on heavy-grade base oils.

The European price premium to US and Asian supplies is forecast to trend lower in the months ahead. In Asia, the prospect of rising Chinese market activity and a seasonal rise in demand in the first half of 2024 is set to boost heavy-grade base oil prices especially. In the US, still-weak base oil margins are expected to prompt more producers to cut base oil run rates. Any rise in Mexican demand for light-grade base oils for use as a fuel extender will likely provide additional price support.

The premium of fca ARA Group II N150 to US Group II N100 is forecast to drop to $160/t by the end of the forecast period. Its premium to Asia Group N150 fob export values is forecast to drop to $209/t.

Europe Group III spreads ***$/t***



The premium of fca ARA Group II N600 to US Group II N600 and Asia Group II N500 fob export prices is projected to drop to $118/t and $251/t, respectively, by the end of the same period.

Premium of fully-approved Grp III surges to record high

Like Group II base oils, Group III prices have extended their weakness since mid-year. But prices for Group III supplies with the full set of OEM approvals have held steadier as supply is more balanced relative to supplies with partial or no approvals. Some producers have offered temporary voluntary allowances of up to $150/t to spur a larger uptake for term volumes.

The premium of fca NWE Group III (a) 4cst values to fca NWE Group III (b) 4cst prices has widened to $402/t. The premium is at its widest on record and significantly higher than historical averages of $100/t since early-2019.

The wide premium underlines differing fundamentals for Group III supplies with and without the full set of OEM approvals. A significant volume of Group III base oils has been diverted towards the European market as Group III prices in that region remain the highest globally.

Supply for fully-approved Group III base oils is more limited as OEM approvals from an European producer lapsed. By contrast, supply availability for supplies without the full set of OEM approvals remains plentiful and prices competitive from producers in Asia and the Mideast Gulf. A structural rise in Chinese Group III production capacity has also reduced buyers' requirements for imported Group III cargo in that region.

The premium of Group III (a) over Group III (b) supplies is set to drop in the months ahead. The unusually wide spread between supplies with and without the full set of approvals will likely prompt more blenders to use the maximum volume of partially-approved supplies permitted. An expected demand recovery in Asia is also expected to curb some of the supply overhang of partially-approved Group III base oils.

The premium of fca NWE Group III (a) prices 4cst to fca NWE Group III (b) 4cst values is forecast to drop to $281/t by the end of the forecast period.

Asia

September forecast

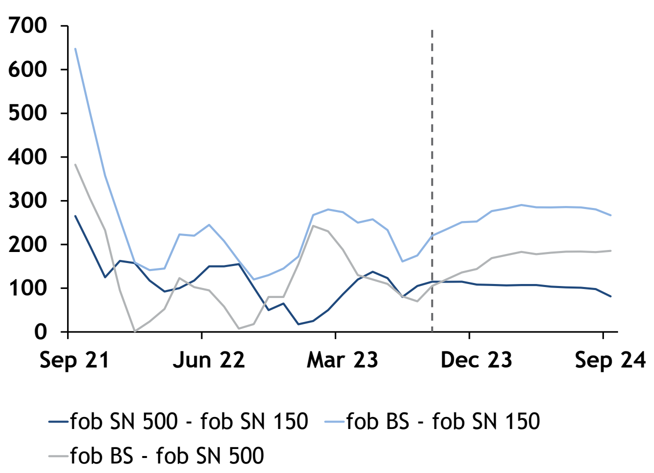
Asia-Pacific Group I base oil export prices at the end of the forecast horizon in September 2024 are largely forecast to be higher than prices at the start of the period in October 2023. Regional Group II and Group III prices are generally projected to be lower at the end of the forecast period.

Base oil prices in the region are forecast to edge higher in the months ahead before trending lower around year-end. A seasonal rise in demand is then set to provide some support to base oil values from the first quarter of 2024.

Asian base oil values have risen from month-ago levels. The price rise reflects firmer crude and competing fuel values that have squeezed base oil margins to some of their lowest levels on record. Several refiners have diverted feedstock towards alternative fuels production. Other producers have reduced base oil production run rates. These moves are adding onto the supply tightness from ongoing and upcoming plant maintenances.

A key Group II base oil producer in South Korea has reduced its run rate following the completion of scheduled maintenance. Japanese base oils production is lower-than-usual as several refineries undergo their turnarounds and as a plant is set to shut permanently by October. Output from an Indian base oil producer has also dropped because of a partial refinery maintenance.

Asia Group I spreads **$/t**



While supply is increasingly limited, demand is showing firmer signs of a revival.

Market activity in India has risen as the monsoon season comes to a close. Term volume offtake has risen in September, even as domestic refiners' prices rise. More buyers are also increasingly comfortable increasing bids to secure spot cargoes amid expectations of rising prices. More than 30,000t of base oils has been scheduled to load in September.

In China, demand for spot volumes is also set to rise. Term volumes remain largely sufficient to cover finished lubricant requirements for now. A weaker yuan against the US dollar is also increasing the cost of imports and weighing on buying interest. But rising domestic prices because of higher feedstock cost and revised taxes have boosted expectations of higher prices. These expectations are prompting firmer interest in spot volumes.

China's manufacturing sector is also showing firmer signs of a revival. Industrial production in August rose by 0.5pc from month-ago levels and by 4.5pc from levels in 2022, according to the National Bureau of Statistics of China. The Caixin China General Manufacturing PMI came in at 51 in August, also signalling an expansion in the sector. Any further rise in Chinese market activity is set to boost demand for the lubricant feedstock.

Weak demand pressures bright stock values

Muted Chinese market activity has so far pressured bright stock values.

Asia Group I bright stock prices are currently at a $220/t premium to Group I SN 150 fob export values. While the premium has risen since July, it remains lower than historical averages of more than $270/t since at least 2010.

Group I bright stock values are at a $105/t premium to Group I SN 500 fob export prices. The premium is at its second-lowest for the year and significantly lower than historical averages of close to $180/t since at least 2010.

Asia

Weaker-than-usual bright stock premiums reflect muted Chinese market activity and demand for the grade. The region typically relies on overseas supplies for its ultra-heavy viscosity grade requirements. Historically, Chinese producers had produced more light-grade base oils because of the crude slate used. China's access to competitively-priced heavy sour crude have since altered that supply dynamic.

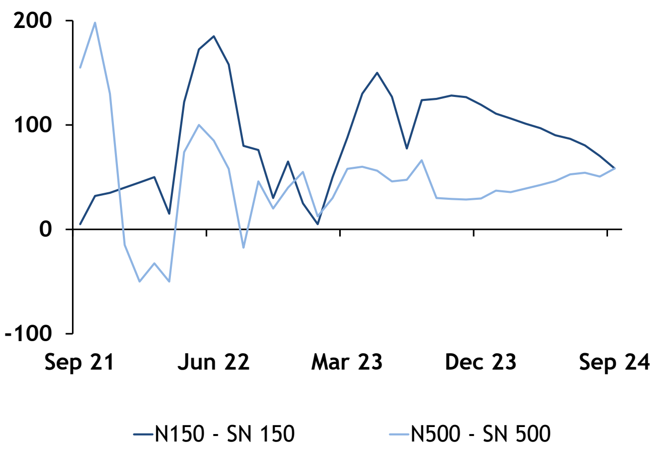
Weaker-than-usual bright stock values will likely incentivise producers to produce more bright stock, should they have the flexibility to do so. At the same time, an open arbitrage to move Asian bright stock to other regions is expected to limit supply availability and provide some price support. Asian bright stock fob export values currently range between a $315-415/t discount to fob export supplies from Europe and the US.

The premium of Asia Group I bright stock prices to Group I SN 150 fob export values is forecast to rise to $267/t by the end of forecast period. The premium of Asia Group I bright stock prices to Group I SN 500 fob export values is forecast to rise to $186/t by the end of the same period.

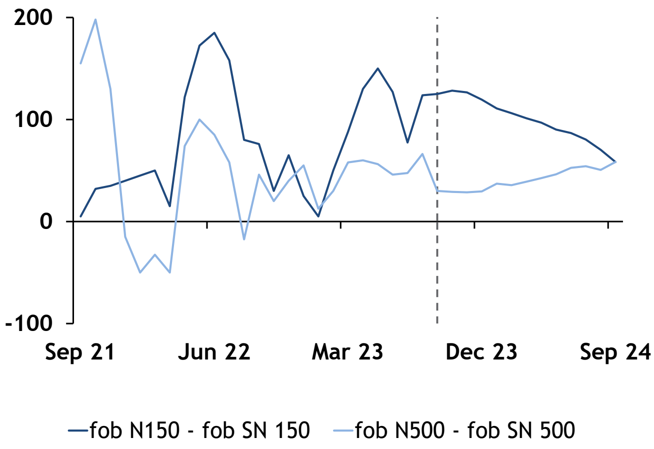
Group II light-grades extend rise

Supply disruptions, rising competing fuel values, and evolving crude trade flows also had more impact on Group II base oils.

Asia intra-group spreads $/t



Asia Group II - Group I spreads $/t



Asia Group II N150 fob export values are currently at a $125/t premium to Group I SN 150 fob export prices. The premium is at some of its highest levels over the past year. Current premiums are also more than three times higher than historical averages of $37/t since at least 2010.

Group II N500 values are at a $30/t premium to Group I SN 500 fob export prices. By contrast, this premium is lower than historical averages of $42/t since at least 2010. The Group II heavy-light grade spread is also significantly lower than usual.

The strength of Group II N150 values reflects the grade's sensitivity towards rising competing fuel values. Light, premium-grade base oils are a closer substitute for alternative fuels production as they can more easily be diverted towards the middle distillates pool. In regions like India, light-grade base oils are also utilised as a fuel extender. Such a move is increasingly attractive when Group II N150 prices are at a discount to regional gasoil values.

Lower Group II heavy-grade premiums also reflect producers' access to heavy sour crude, which boosts the yield of base oils and heavy-grade base oils especially. In China, tax revisions also incentivise production of more heavy-grade base oils.

Asia

Higher-than-usual Group II light-grade premiums are not expected to persist. A wide spread between Group II N150 and Group I SN 150 will likely incentivise blenders to use more Group I base oils, should they have the flexibility to do so. At the same time, weak Group II N500 values are expected to prompt more refiners to divert feedstock towards the production of other grades. Any rise in Chinese market activity will provide additional support to heavy-grade prices in the region.

The premium of Asia Group II N150 fob export prices to Asia Group I SN 150 fob export values is forecast to drop to $58/t by the end of the forecast period. The premium of Asia Group II N500 fob export prices to Asia Group I SN 500 fob export values is expected to increase to $58/t by the end of the same period.

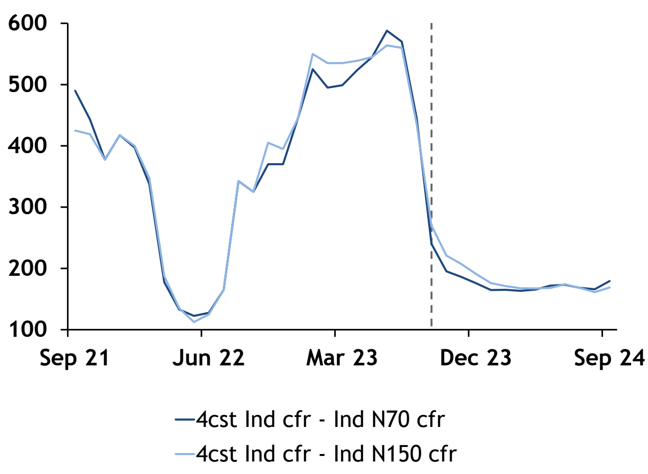
Rising supply pressures Grp III – Grp II spreads

While Group I and Group II base oil values have risen, Group III prices have extended their drop since mid-year.

The result is a narrower Group III – Group II spread that is at its lowest in close to a year.

Group III 4cst cfr northeast Asia (NEA) prices are currently at a $340/t premium to Group II N150 fob export values. While the premium has narrowed, it remains higher than historical levels of $182/t since mid-2011.

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



Group III 4cst cfr India values are at a $240/t premium to Group II N70 cfr India prices. The premium is at its lowest in more than a year. It remains higher than historical averages of $180/t since mid-2018.

Group III – Group II spreads in Asia are also narrower than their respective spreads in the US and Europe. US domestic Group III 4cst prices are at a $573/t premium to US domestic Group II N100 values. Fca northwest Europe Group III 4cst prices are at a $561/t premium to fca Antwerp-Rotterdam-Amsterdam Group II N150 values.

This disparity highlights a structural rise in Group III production in Asia. Two new Group III plants have started in China since the start of the year. The new capacities follow a series of premium-grade plant start-ups since late-2017. Several other plants in India have started or are slated to begin operations in 2023 and 2024. Most of the world's Group III production capacity is also held in Asia. Asia accounts for more than half of the world's total Group III nameplate production capacity.

Narrower Group III – Group II spreads also highlights more flexibility to use base oils interchangeably in the region. In some regions like India, buyers prioritise a base oils' price and viscosity rather than its viscosity index. By contrast, blenders in other regions typically require more OEM approvals for their base oils.

Group III prices in the region are forecast to extend their weakness to Group II values. The trend reflects a structural rise in Group III nameplate production capacity with refineries that have yet to run at optimal levels. But an open arbitrage to move more Group III supplies out of Asia will likely curb some of the supply overhang and limit the size of the price drop.

The premium of Group III 4cst cfr NEA to Asia Group II N150 fob export values is forecast to drop to $250/t by the end of the forecast period. The premium of Group III 4cst cfr India to Group II N70 cfr India prices is projected to drop to $179/t by the same period.

Maintenance and shutdowns

Upcoming / recent base oil plant maintenance / shutdowns / closures					
Refiner	**Location**	**Timing**	**Capacity**	**Capacity affected**	**Cause**
Luberef	Jeddah, Saudi Arabia	Mid-2026	270,000 t/yr	All, Group I	Closure
ExxonMobil	PAC, Singapore	2025 for 2 months	660,000 t/yr	NA	Refinery turnaround
Cepsa	San Roque, Spain	Nov 2024	265,000 t/yr	All, Group I	Maintenance
SK Enmove	Ulsan, South Korea	Apr 2024	26,000 b/d	All, Group III	Maintenance
Petronas	Melaka, Malaysia	Jan 2024	280,000 t/yr	All, Group II/III	Refinery turnaround
Petrobras	Rio de Janeiro, Brazil	Nov 2023 for 30 days	90 mn l/mth	All, Group I	Maintenance
ENEOS	Wakayama, Japan	By Oct 2023	360,000 t/yr	All	Refinery closure
Formosa	Mailiao, Taiwan	13 Oct 2023 to 9 Dec 2023	600,000 t/yr	All, Group II	Maintenance
HF Sinclair	Tulsa, Oklahoma, US	End-Sep 2023 for 45 days	490,000 t/yr	All, Group I	Maintenance
BPCL	Mumbai, India	From mid-Sep 2023	180,000 t/yr	Partial, Group II	Refinery maintenance
Cosmo Oil	Yokkaichi, Japan	From 9 Sep 2023	175,000 t/yr	All	Electrical issue
HD Hyundai Shell	Daesan, South Korea	From 5 Sep 2023	1.2 mn t/yr	Partial	Run-cut
ENEOS	Mizushima A, Japan	Late-Aug 2023 for 3 months	225,000 t/yr	Full	Refinery maintenance
Henan Junheng	Henan, China	18 Aug 2023 for 1 month	400,000 t/yr	All, Group II	Catalyst change
Naftan	Novopolotsk, Belarus	From mid-Aug 2023 for 1	200,000 t/yr	Partial	Maintenance
Rosneft	Angarsk, Russia	Ely-Aug to mid-Sep 2023	250,000 t/yr	All	Maintenance
Acelen	Mataripe, Bahia, Brazil	Aug to Sep 2023 for 45 days	1,750 b/d	All, Group I	Maintenance
HD Hyundai Oilbank	Daesan, South Korea	25 Aug 2023 for 7 days	25,000 b/d	Full	Fire
HD Hyundai Shell	Daesan, South Korea	25 Aug 2023 for 7 days	1.2 mn t/yr	Full	Refinery fire
HD Hyundai Oilbank	Daesan, South Korea	10 Aug to 4 Sep 2023	25,000 b/d	Partial	Refinery maintenance
HD Hyundai Shell	Daesan, South Korea	From end-Jul to 4 Sep 2023	1.2 mn t/yr	Partial	Refinery maintenance
MOL	Szazhalombatta, Hungary	12 Jul 2023 to 26 Aug 2023	195,000 t/yr	All	Maintenance
Petronas	Melaka, Malaysia	8-14 Jul 2023	280,000 t/yr	All, Group II/III	Refinery turnaround
ENEOS	Mizushima A, Japan	5 Jul 2023 for 15 days	225,000 t/yr	All, Group I	Refinery fire
Hainan Handi	Hainan, China	Ely-Jul for 20 days	400,000 t/yr	All, Group II	Maintenance
Avista Oil	Peachtree City, Georgia, US	Late Jun for 1 week	1,250 b/d	All, Group II+/III	Maintenance
Tatneft	Nizhnekamsk, Russia	Mid-Jun 2023 for 1 month	186,000 t/yr	All	Maintenance
Heritage-Crystal Clean	Indianapolis, Indiana, US	Mid-Jun for 10 days	2,500 b/d	All, Group II+	Maintenance
Excel Paralubes	Westlake, Louisiana, US	Ely-Jun to 2H Jun 2023	22,200 b/d	All, Group II	Unplanned outage
S-Oil	Onsan, South Korea	End-May to mid-Jul 2023	41,000 b/d	All, Group II/III	Maintenance
Panjin Northen Asphalt	Liaoning, China	Late-May 2023 for 2 months	400,000 t/yr	All, Group II	Maintenance
SK-Repsol	Cartagena, Spain	11 May 2023 for 40 days	630,000 t/yr	All, Group III	Maintenance
MOH	Agioi Theodoroi, Greece	Mid-May to end-Jun 2023	224,000 t/yr	All, Group I	Maintenance
ENEOS	Kainan, Japan	May 2023 for 2 months	200,000 t/yr	Partial	Refinery maintenance
Chevron	Pascagoula, Mississippi, US	Late-Jun to Jul 2023	23,000 b/d	All	Catalyst change
ExxonMobil	Jurong, Singapore	May to mid-Jun 2023	2.25 mn t/yr	Partial, Group II	Refinery turnaround
ENI	Livorno, Italy	29 Apr to end-Jul 2023	600,000 t/yr	All, Group I	Maintenance
Calumet	Shreveport, Louisiana, US	2H Apr for 2 weeks	8,000 b/d	All, Group I/II	Maintenance
Rosneft	Novokuibyshevsk, Russia	Mid-Apr to late-May 2023	350,000 t/yr	All	Maintenance
Lukoil	Volgograd, Russia	Mid-Apr to ely-May 2023	560,000 t/yr	Partial	Maintenance
Lukoil	Perm, Russia	Mid-Apr to ely-May 2023	460,000 t/yr	Partial	Maintenance
Pertamina-SK	Dumai, Indonesia	01 Apr – mid-Apr 2023	9,000 b/d	All, Group III	Refinery fire
Sinopec Maoming	Guangdong, China	Apr - May 2023	700,000 t/yr	Partial, Group I/II	Maintenance
CNOOC Taizhou	Jiangsu, China	Apr 2023	400,000 t/yr	All	Maintenance
Shandong Huanghe	Shandong, China	End-Mar 2023 for 1 month	180,000 t/yr	All, Group II	Catalyst change
ExxonMobil	Port Jerome, France	21-29 Mar 2023	626,000 t/yr	Partial	Strike action
Total	Gonfreville, France	From 21 Mar 2023	240,000 t/yr	All	Strike action
Rosneft	Ufa, Russia	2H Mar to ely-May 2023	240,000 t/yr	Partial	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.

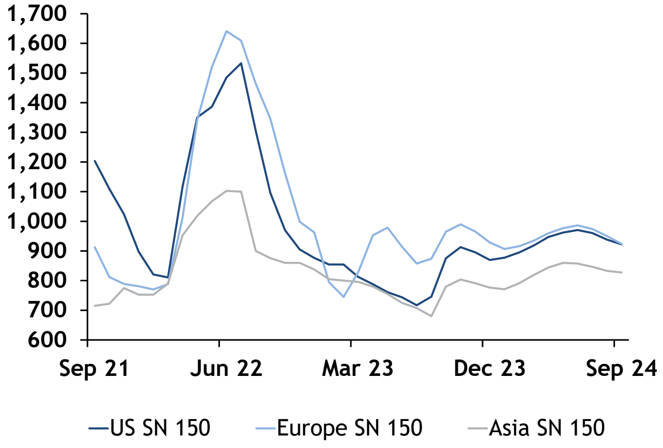
Market fundamentals

Upcoming / recent expansions / conversions / new plants

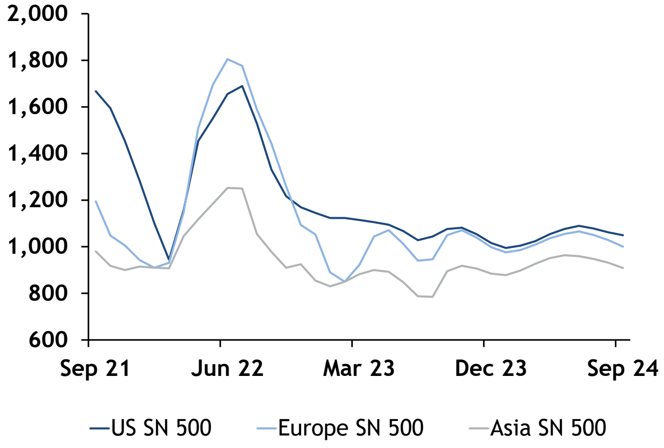
Refiner	Location	Timing	New capacity	Grade	Expansion / new plant
IOC	Haldia, India	2027	270,000 t/yr	Group III	New
IOC	Chennai, India	2027	250,000 t/yr	Group II	Expansion
ReGen III	Texas City, US	NA	Up to 5,600 b/d	Re-refined Group II+/III	New
ReGen III	Alberta, Canada	NA	Up to 2,200 b/d	Re-refined Group II+/III	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
Luberef	Yanbu, Saudi Arabia	2026	175,000 t/yr	Group III	Conversion/new
Luberef	Yanbu, Saudi Arabia	2026	100,000 t/yr	Group II	Conversion/expand
ExxonMobil	Jurong, Singapore	2025	1mn t/yr	Group II N150, N600, high-vis base oils	New
Saudi Aramco/Sabic	Yanbu, Saudi Arabia	2025	NA	NA	New
IOC	Panipat, Delhi, India	2024-2025	540,000 t/yr	Group II/III	New
Avista Oil	Dollbergen, Germany	2024	NA	Group III re-refined	New
Fergana	Fergana, Uzbekistan	2024	Up to 100,000 t/yr	Group II/III 2cst, 4cst, 6cst and 8cst	New
BPCL	Mumbai, India	2024	450,000 t/yr	Group II N65, N150, N500, Group III 8cst	Expansion
Hongrun Petrochemical	Weifang, Shandong,	Apr-May	Up to 500,000 t/yr	Group III; white oils	New
IOC	Vadodara, Gujarat, India	2023	235,000 t/yr	Group II/III	New
Chevron	Richmond, California	Jul 2023	2,500 b/d	Group III 4cst and 6 cst	Conversion
Hainan Handi Sunshine	Hainan, Yangpu, China	Jan 2023	Up to 800,000 t/yr	Group II+/III 4cst	Conversion
Avista Green	Kalundborg, Denmark	2024-2026	Up to 40pc higher	Group I+ re-refinery	New
Xinji-Feitian	Hebei, China	Ely-Sep 2022	250,000 t/yr	Group II/III	New
Nuspec Oil	York, United Kingdom	2Q 2022	Up to 5,000 t/yr	Bio-bright stock	New
Tayras	Selimiye, Turkey	Mid-Jan 2022	40,000 t/yr	Group II+ re-refinery, N70, N110, N220	New
Hyundai Oilbank	Daesan, South Korea	Jan 2022	NA	Group II bright stock	New
EGEO Oil	Portugal	2022	14,000 t/yr	Group I re-refined SN 80/150/200/350	New
Hainan Handi	Hainan, China	2022	300,000 t/yr	Group II re-refinery	Cancelled
Gazpromneft	Omsk, Russia	Aug 2023	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
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
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
Shenghong Petrochemi-	Lianyungang, China	2021	620,000 t/yr	Group II/III	Cancelled
Sasol	Louisiana, US	After 2020	NA	GTL	Cancelled
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

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

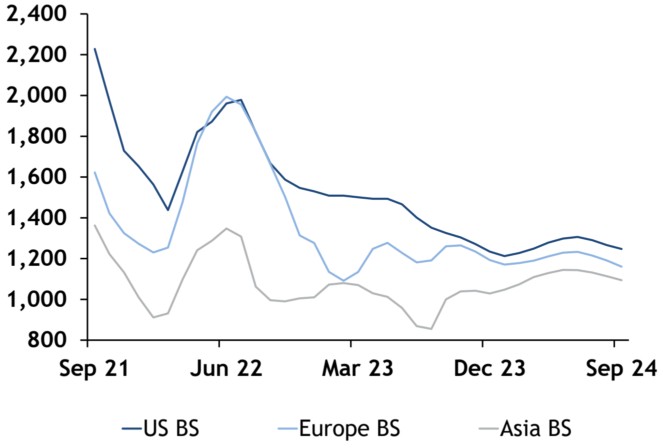
Group I SN 150 fob export $/t



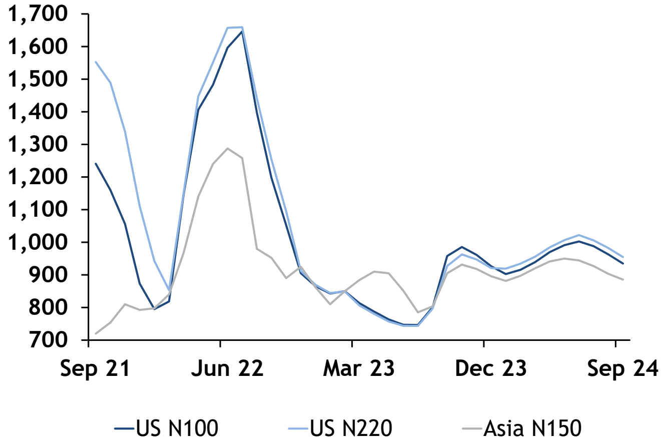
Group I SN 500 fob export $/t



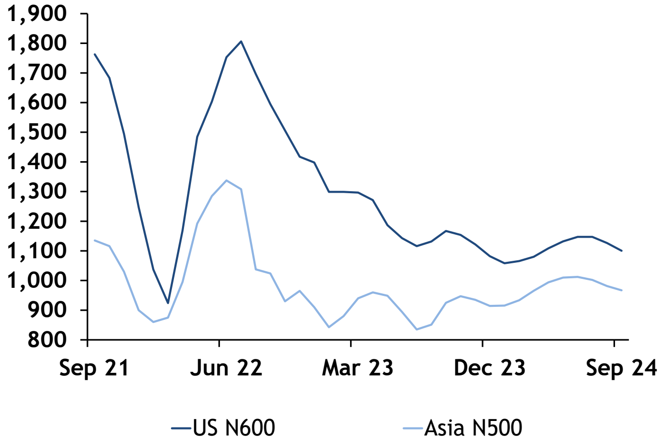
Group I bright stock fob export $/t



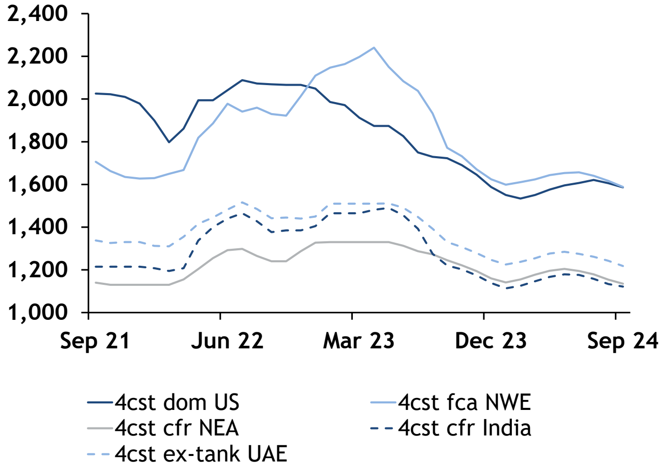
Group II N100 & N150 & N220 fob export $/t



Group II N500 & N600 fob export $/t



Group III 4cst $/t



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