

# Argus Biofuels Outlook



## Overview

European fuel suppliers procured as much diesel as they could store ahead of the EU embargo on Russian product imports coming into force on 5 February, leading to an oversupplied market and weak middle distillate prices, which weighed on all biodiesel grades, HVO classes and SAF. In a break with seasonal market dynamics, European RME prices lost support in mid-winter. Global soybean shortages are supporting higher SME prices, and with little alternatives for a summer-specification fuel, RME and FAME 0°C prices have started to converge. Lower prices across the biodiesel complex are a direct result of oversupply of RSO and UCO. There is little risk to the upside on rapeseed oil in the short term, but UCO availability has started to change in recent weeks since the EU's new trace system resulted in some disruption to shipments from Asia-Pacific, where Indonesia is limiting export allowances of UCO and palm oil to the wider markets.

US RINs continue to stagnate relative to the provisional credit targets, with prices expected to continue weakening until September. Demand for ethanol, biodiesel and renewable diesel is expected to have fallen in February, owing primarily to weak road fuel demand.

The end of the sugarcane harvest in Brazil has seen ethanol production decline sharply from the end of 2022, as mills start turning to corn for inter-harvest production. Tight global soybean supply is likely to support Argentinian biodiesel prices, but growth will be capped by what European markets are willing to pay, with a weak rapeseed complex providing a cheap alternative to SME.

### Key biofuel prices, prompt

	Jan 23	Feb 23	Mar 23e	Apr 23e
Europe				\$/t
RED FAME 0°C CFPP fob ARA range	1,351	1,328	1,439	1,462
RED Rapeseed OME fob ARA range	1,678	1,552	1,516	1,527
RED UCOME fob ARA range	1,632	1,564	1,651	1,709
RED HVO fob ARA range (Class II)	2,507	2,326	2,476	2,483
SAF fob ARA range (Class II)	3,332	3,225	3,433	3,435
Bionaphtha fob ARA	2,568	2,524	2,479	2,504
UCO cif ARA range	1,129	1,111	1,176	1,220
Ethanol Regular fob ARA range	1,030	1,130	1,189	1,315
US (biofuels)				¢/USG
Ethanol Chicago (Argo in-tank transfer)	218	217	207	215
B100 SME Chicago (Argo in-tank transfer)	646	588	592	586
R100 (UCO-based) del California	796	764	763	763
US (feedstocks)				¢/lb
Soybean oil crude degummed US Gulf coast del rail	68	66	65	66
UCO US Gulf coast del rail	71	59	58	58
Tallow bleached fancy US Gulf coast del rail	70	58	58	58
South America				\$/m <sup>3</sup>
Anhydrous fob Santos	705	681	666	680
Asia-Pacific				\$/t
RED HVO Class II Singapore fob	2,409	2,227	2,375	2,376
UCO fob China	1,075	1,037	1,103	1,145
Ucome RED fob China	1,350	1,297	1,361	1,410

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# EUROPE

## Summary

### This month

Rapeseed prices have lost support in Europe as a result of lower demand and high inventories, leading to declining rapeseed oil (RSO) and rapeseed methyl ester (RME) prices during most of February and into early March, which ultimately pulled prices across all biodiesel grades lower. Used cooking oil methyl ester (Ucome) prices fell as producers are oversupplied with UCO and diesel demand remains weak.

### Next month

There is little to suggest that RSO prices will rebound in the short term, particularly from April onwards as demand for other grades picks up in Europe, which could lead to even lower RME prices. On the other hand, soy methyl ester (SME) prices could strengthen owing to tight global supply of soybean oil (SBO), but the extent of this increase will inevitably be capped by falls in RME prices, which are tracking declining RSO values.

In contrast, ethanol prices started to increase in early March and are likely to strengthen further in the coming months as a result of rising demand and firmer feedstock prices.

### 3-6 months ahead

Ireland and Norway have recently approved mandate changes that would increase biofuel consumption in both countries — starting with Ireland introducing E10 as its standard grade of gasoline in April, and Norway likely to introduce a 2pc sustainable aviation fuel (SAF) mandate and a 4pc mandate in maritime fuels in July. Further regulatory discussions are likely to come from Germany, as it attempts to reduce the cap on the use of crop-based biofuels, and from the EU, which continues to review its renewable energy directive and feedstock lists.

### 6-12 months forward

Into 2024, our forecasts lead to biodiesel and hydrotreated vegetable oil (HVO) prices moving in different directions, as biodiesel strengthens while HVO weakens, bucking the previous trend of prices tracking demand for diesel blending components. Biodiesel prices are unusually low at present and winter demand for RME should bring prices up next season unless the oversupply of feedstock remains pronounced, which is difficult to predict owing to uncertainty over the harvest. But on the HVO side, additional capacity should see prices ease in the medium term, provided that the availability of UCO and other advanced feedstocks remains ample.

## Regulation

### EU may fine states over RED adoption notification

The European Commission has referred Hungary, Portugal and Croatia to the European Court of Justice (ECJ) for failing to transpose the Renewable Energy Directive (RED II) into national law by 30 June 2021, with a request that financial sanctions are imposed. The move follows the commission issuing reasoned opinions in May 2022, urging the three countries to transpose the regulations. The three countries have failed to notify the EU of where they have transposed each provision, the commission says.

Portugal and Croatia are already operating above the legally binding target of renewables accounting for 32pc of final energy consumption by 2030. Renewables, including biomass, accounted for over 52pc of Portugal's generation in 2022 and more than two-thirds of Croatian output. But Hungary generated just 16pc of its power from renewables last year.

In January, a fourth reasoned opinion was issued to Spain, urging the country to accelerate the integration of RED II into national law, or risk being referred to the ECJ within two months. The commission has also instructed Latvia and Poland to correctly transpose RED II within two months or face similar referral to the ECJ.

### Ireland sets new biofuel blending targets

Ireland is set to adopt E10 as its standard grade of gasoline in April and B20 as its standard diesel grade by 2025. The measures are part of new regulations aimed at achieving a 51pc reduction in transport emissions, one of the targets outlined in the country's 2023 climate action plan.

### Norway mulls SAF mandate rise, biomarine targets

The Norwegian government has proposed increasing its biofuels blending mandate for aviation to 2pc, and the introduction of a 4pc mandate on domestic maritime transport, including fishing and military vessels, from 1 July, rising to 6pc in 2024. Only advanced biofuels — which in Norway are defined as renewable fuels produced from feedstocks listed in Annex IX A and B of the recast RED II — can be used to meet the obligation, excluding biomethane.

### EU Traces-NT system likely to be delayed

The European Commission's new Traces-New Technology (NT) certification requirement is likely to be delayed. Traces-

NT is the commission's platform for certifying imports of animals, animal products, food and feed, and plants to the EU. The commission initially asked overseas UCO suppliers to register with the Traces-NT system through their local authorities by 31 January to attest that cargoes are of vegetable oil origin.

The expected delay gives exporters some temporary relief, as non-EU UCO suppliers will not have to be registered by their local authorities, for the time being at least. Asian UCO suppliers have been finding it difficult to secure the required veterinary sign-off and register with their local governments. The European Waste-based and Advanced Biofuels Association previously asked the commission for a 24-month transition period to prevent a halt of UCO imports.

### London Heathrow targets 1.5pc SAF in 2023

London's Heathrow airport is aiming to triple the share of SAF in fuel used at the airport to 1.5pc this year, boosted by an incentive scheme that helps airlines cover the extra costs of using biojet. The scheme involves Heathrow covering the cost of up to half of SAF's premium to conventional jet fuel for those airlines that participate in the scheme.

## Demand

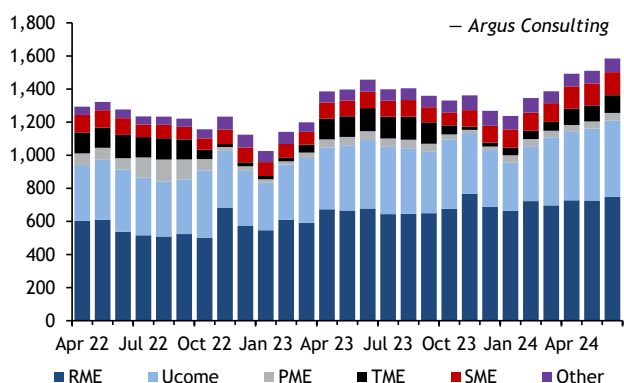
### Biodiesel

#### Higher CFPP grades return to the blend mix

March marks the start of spring and as temperatures begin to rise through this month and next, fuel suppliers can produce road fuel blends with higher cold filter plugging point (CFPP) properties, allowing more waste-based components to be used. We expect total biodiesel consumption in March to rise by 5pc from February to be just under 1.2bn litres, owing to higher diesel demand.

#### European biodiesel demand

mn litres



As countries start moving away from winter fuel specifications, we expect demand for biodiesel grades with higher CFPPs, particularly waste-based fuels, to strengthen during spring. Ucome demand will rise to 392mn litres in March, up by 17pc from a month earlier, and we expect demand to remain fairly stable at around 1.18bn litres in the second and third quarters. Tallow methyl ester (TME) remains a much less liquid product, but we expect demand for tallow-based biodiesel of 48mn litres this month, more than doubling from February, and rising to 126mn litres in April. We forecast average monthly TME demand will remain close to 130mn litres through the second and third quarters, owing to limited feedstock availability in European markets.

### Spanish biodiesel consumption falls in 2022

Spain's biodiesel blending rates are expected to have fallen last year, to an average of 5.67pc compared with 6.52pc a year earlier, the latest data available from Spain suggest. This represents a total fall in consumption of 11pc, to 1.38bn litres for 2022.

### Record recovery for biodiesel demand in France

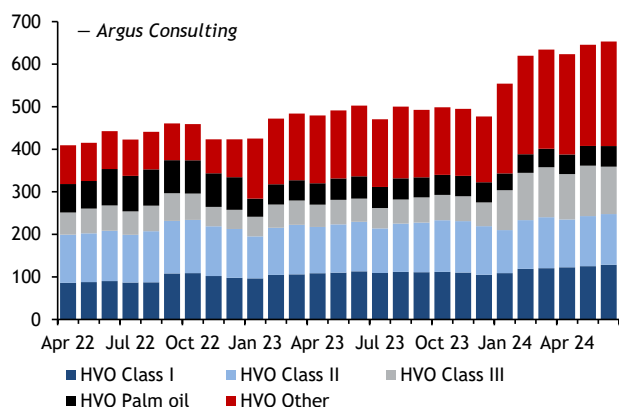
Several French refineries were shut down by strike action in October, dampening road fuel demand as filling stations ran out of fuel, driving up prices. Short-term road fuel supply constraints weighed on biofuel product demand, and biodiesel consumption fell by 29pc from a month earlier to 164mn litres in October. This was the third-lowest month for biodiesel consumption in France since the start of 2019, above only April and November 2020, when demand was hindered by strict Covid-19 lockdowns.

Demand recovered swiftly once the strikes were resolved, with biodiesel consumption rising by 82pc to 297mn litres in November. And consumption across October and November averaged around 230mn litres/month, unchanged from September, suggesting that the strikes will not have had a significant impact on the country's annual demand.

### HVO

#### Strong demand growth in the first quarter

We estimate that HVO demand has grown strongly in the current quarter in line with higher blending obligations. Demand in January remained flat compared with a month earlier, but we estimate that total consumption rose by 11pc to 472mn litres in February, and we expect a further 2.5pc rise to 484mn litres in March. This would bring total demand for the current quarter to an estimated 1.38bn litres, up by 12pc from the same quarter last year.

**European HVO demand****mn litres**

Looking at the breakdown by class, we estimate that crop-based HVO will account for 32pc of total demand in the current quarter, of which 22pc will be HVO Class I, and 10pc HVO from palm oil — which has now been removed from the Argus price assessment. HVO from UCO (Class II), tallow (Class III) and other feedstocks are estimated to account for 24pc, 11pc and 33pc, respectively. Looking ahead, we expect demand in the next quarter to rise by a further 6.7pc to 1.47bn litres, driven by an anticipated increase in diesel demand from June, ahead of the summer driving season.

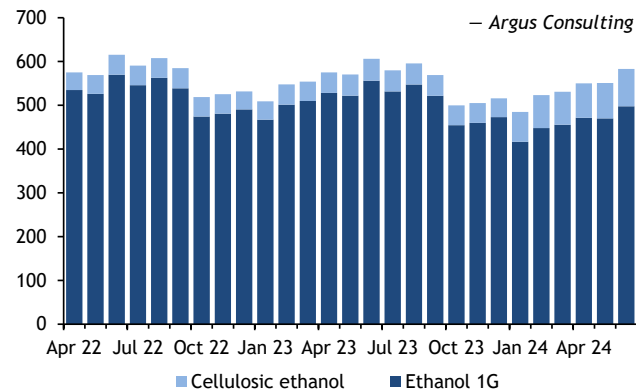
**Finland more than halves annual consumption in 2022**

Many national reporting agencies have released preliminary data for the whole of 2022 and we now estimate that Europe consumed 5.1bn litres of HVO last year, up by 10pc from 2021. While consumption increased across Europe as a whole, individually countries moved in a variety of directions.

A notable change of pace came from Finland, where HVO was previously a popular biofuel blending component owing to cold weather and a high blending obligation. Finland relaxed its blending mandate last year in response to rising fuel prices, resulting in a 58pc fall in HVO demand to 228mn litres. This reduction pushed Finland down the list of major HVO markets, accounting for just 4pc of European HVO consumption last year, compared with 12pc in 2021.

**Ethanol****Ethanol demand grows with rising gasoline demand**

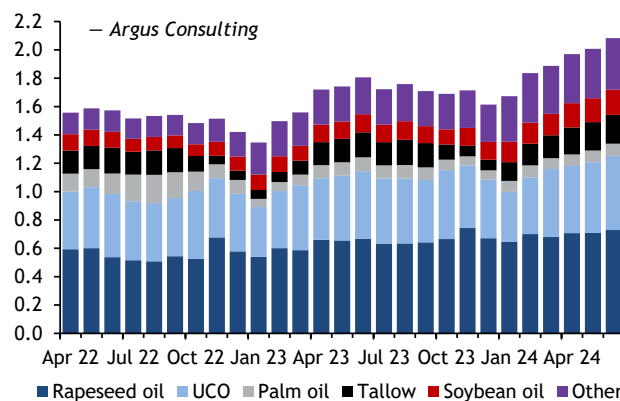
We expect ethanol consumption to have risen by 7.6pc from January to 548mn litres in February, tracking higher demand for gasoline. This would be the highest monthly total since October and an increase of 2.3pc on the year. We forecast demand will continue to strengthen, peaking at around 610mn litres in June. We expect European ethanol consumption to total 6.6bn litres this year, down by 1.2pc from a year

**European ethanol demand****mn litres**

earlier, owing to weaker gasoline demand as electrification continues to replace internal combustion engines in the vehicle fleet and several countries remain at an initial stage of recession, and with no significant changes in country-level ethanol mandates expected to take place this year.

**Feedstocks****UK suppliers focus on double-counted feedstocks**

Only 8.8pc of UK biodiesel came from crop-based feedstocks in 2022, the latest data from the UK's renewable transport fuel obligation scheme show, split almost equally between palm and SBO. Biodiesel certifications submitted to the UK transport ministry do not yet account for total reported biodiesel consumption last year, but the trend is clear and the feedstock mix has seen little change since the previous report. The remaining feedstocks are all eligible for double counting, with "mature" feedstocks such as UCO, brown grease and tallow accounting for 85.7pc of the mix and the remaining 5.5pc coming from advanced feedstocks such as palm oil mill effluent, soap stock acid, and food waste.

**Biodiesel and HVO feedstock demand****mn t**

European demand outlook										mn litres	
Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
Biodiesel											
PME	18	19	33	49	51	53	153	153	74	131	129
RME	546	609	591	674	666	678	2,017	1,939	2,130	2,085	2,203
SME	84	84	77	97	96	99	292	287	279	333	407
TME	20	21	48	126	125	140	391	401	98	150	302
Ucome	290	334	392	373	394	414	1,181	1,173	1,128	1,029	1,311
Other	68	73	57	67	66	73	206	210	252	241	236
<b>Total</b>	<b>1,026</b>	<b>1,141</b>	<b>1,198</b>	<b>1,385</b>	<b>1,397</b>	<b>1,457</b>	<b>4,239</b>	<b>4,163</b>	<b>3,961</b>	<b>3,970</b>	<b>4,588</b>
HVO											
HVO Class I	97	105	106	109	110	113	332	332	327	349	377
HVO Class II	99	111	116	109	114	116	339	335	357	335	349
HVO Class III	46	54	57	52	58	55	164	164	174	322	337
HVO Palm oil	43	48	47	50	50	52	153	146	142	127	141
Other	184	202	204	210	210	218	639	633	613	802	860
<b>Total</b>	<b>425</b>	<b>472</b>	<b>484</b>	<b>480</b>	<b>491</b>	<b>503</b>	<b>1,474</b>	<b>1,464</b>	<b>1,471</b>	<b>1,808</b>	<b>1,922</b>
Ethanol											
Ethanol 1G	467	502	510	528	522	556	1,606	1,601	1,387	1,320	1,439
Cellulosic ethanol	42	46	44	47	48	50	145	144	134	219	245
<b>Total</b>	<b>509</b>	<b>548</b>	<b>554</b>	<b>575</b>	<b>570</b>	<b>606</b>	<b>1,752</b>	<b>1,744</b>	<b>1,521</b>	<b>1,539</b>	<b>1,684</b>
<b>Grand total</b>	<b>1,960</b>	<b>2,161</b>	<b>2,237</b>	<b>2,440</b>	<b>2,459</b>	<b>2,565</b>	<b>7,465</b>	<b>7,371</b>	<b>6,953</b>	<b>7,317</b>	<b>8,194</b>

## Prices

### Biodiesel

#### Biodiesel prices down on weak fundamentals

Average prices for all biodiesel grades in February fell on the month, tracking lower vegetable oil and diesel prices, which declined as suppliers filled up storage ahead of the EU's embargo on Russian product imports taking effect on 5 February. This left the market well supplied, weakening prices.

We expect RME prices to continue to weaken, falling by 2.3pc from February to \$1,516/t in March, with a small rise in the second-quarter average to above \$1,540/t owing to tight SME supply and the absence of competition from palm methyl ester (PME). We anticipate SME prices to rise by 5.2pc in March to \$1,471/t and remain well supported at around \$1,510/t in April-September.

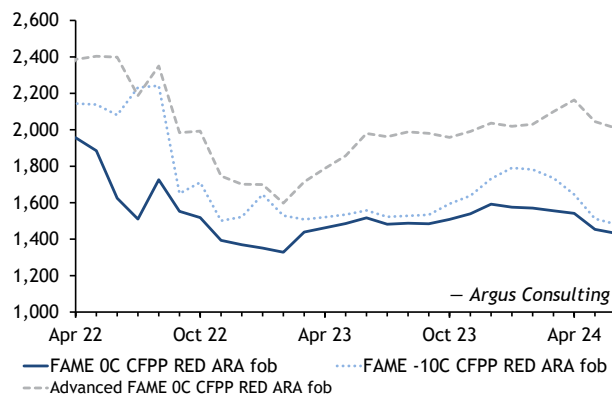
Ucome and Advanced FAME 0°C also fell on the month in February, by 4.2pc and 6.0pc to \$1,564/t and \$1,598/t, respectively. The market remained oversupplied with UCO during most of February, which weighed on prices, but we expect both biofuels to regain support this coming month, and rise by 5.6pc to \$1,651/t for Ucome and by 7.3pc to \$1,714/t for Advanced FAME 0°C.

#### RME and FAME 0°C prices converge

The prompt physical price spread between European RME and blended FAME 0°C fell from \$445/t on 8 February, the highest since 23 August, to \$62/t on 21 February, the lowest since 27 September. The spread averaged \$327/t in January, \$370/t in January 2022 and \$156/t in February 2022. It is not unusual for the spot spread to narrow towards the second quarter, but the scale and pace of the decline this year has been significant.

#### European FAME prices

\$/t



Part of this convergence of price is the result of seasonal factors as demand for RME begins to wane, with buyers increasingly looking toward blending obligations for the spring. But the extent of the narrowing compared with recent years could also be attributed to changes to national legislation, such as the removal of palm oil in Germany as an eligible biofuel feedstock from 1 January. Additionally, SME in Europe has been in tight supply in the first couple of months of 2023, with a decline in imports from Argentina in the second half of 2022 because of low European prices relative to importing costs, leaving RME and Ucome as the only widely available feedstocks for blending.

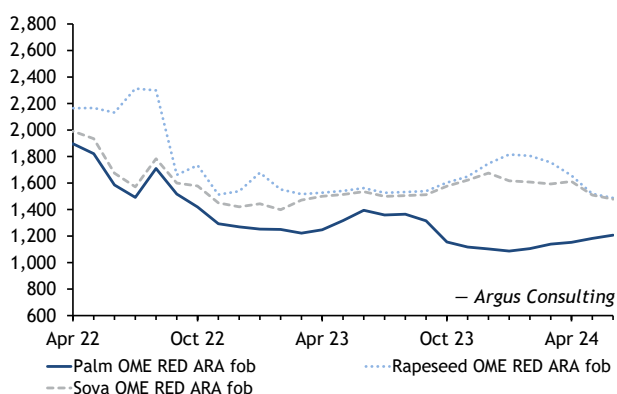
### HVO

#### HVO Class I and II spread narrows

HVO Class I briefly traded above Class II in the last week of January, and in our previous report it was not yet clear how long this unusual market dynamic would last. But it proved to be short-lived, and HVO Class II quickly returned to a premium, although illiquid markets and unworkable prices for UCO exporters kept the two products remarkably close in

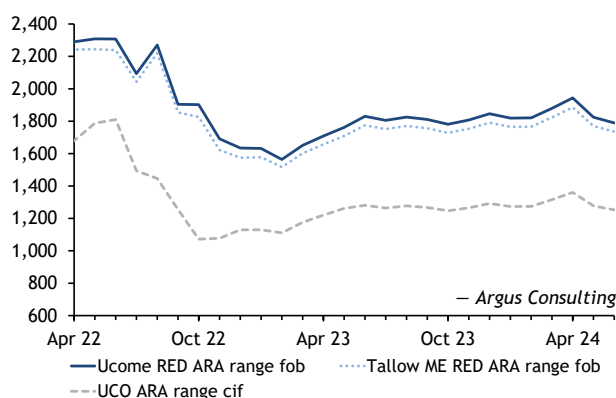
#### European crop-based biodiesel prices

\$/t

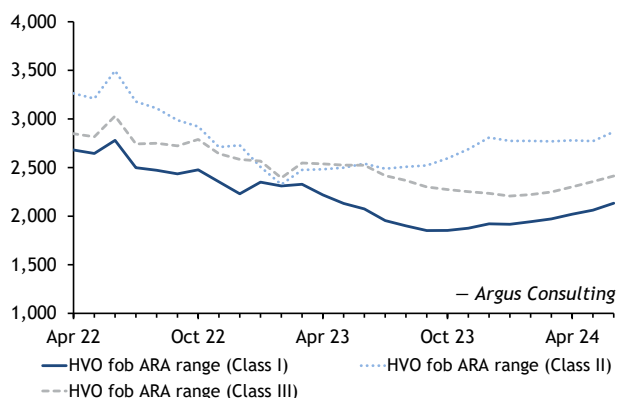


#### European waste-based biodiesel prices

\$/t





**European HVO prices**

price through February. The average monthly price for Class II was \$2,326/t, holding only a \$16/t premium to Class I.

**HVO Class III maintains premium to Class II**

With few HVO Class III trades reported, the premium to the underlying gasoil contract remained steady for most of February. The average price fell by 6.7pc to \$2,394/t, the second consecutive month that Class III prices were at a premium to Class II, and the spread widened to \$68/t from \$60/t. With no immediate signs of this price relationship returning to what was seen in 2022, we forecast HVO Class III to remain at a premium to Class II until June, when Class III prices of \$2,524/t will be at a small discount to Class II prices of \$2,540/t, with Class II prices maintaining a premium in the second half of the year.

**SAF****SAF market rally expected after jet slump**

European markets rushed to fill their middle distillate stocks in January, resulting in jet fuel prices falling by 13pc in February, although they are expected to recover in March. This drove the highest month-on-month decline in outright average SAF prices since July, while premiums to the underlying gasoil contract remained relatively unchanged. SAF prices in February were down by 3.2pc on the month at \$3,225/t, the lowest since December 2021. In line with the forecast for jet fuel prices to recover, we expect SAF prices to rally in March, rising by 6.5pc on the month to \$3,433/t, remaining relatively flat through the second quarter at an average of \$3,450/t.

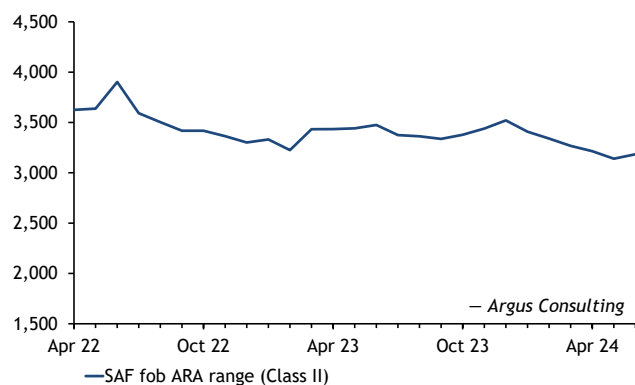
**Bionaphtha****Bionaphtha markets remain bearish**

Bionaphtha prices continued to decline month on month, in the absence of interest from the oleochemical markets,

\$/t

**European SAF prices**

\$/t



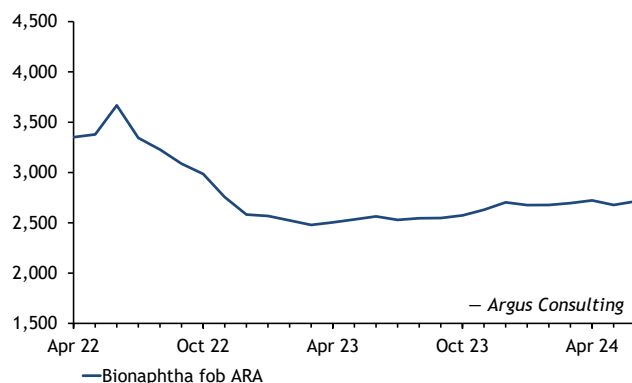
marking the eighth consecutive month of this trend. Prices in February fell by 1.7pc on the month to \$2,524/t. Some trades came from outside the oleochemicals market, signalling that prices may soon be at acceptable levels for most market participants and that trade could soon pick up. We expect prices to continue to decline in March, averaging around \$2,480/t, and expect some price stability may emerge through the second quarter. We predict that prices will finally regain some support from the start of the second quarter and average around \$2,540/t in April-September.

**Ethanol and ETBE****Bullish gasoline continues to support ethanol prices**

Gasoline prices have continued to recover from lows in December, supporting rising ethanol prices in line with demand for biofuel blending components. Prices in February for regular and premium ethanol grades rose by 9.7pc to \$1,130/t and by 10.6pc to \$1,201/t, respectively. We forecast strong and continued price growth through the next five months, as regular and premium grades rise to an estimated \$1,420/t and \$1,500/t in July, during the peak driving season.

**European bionaphtha prices**

\$/t

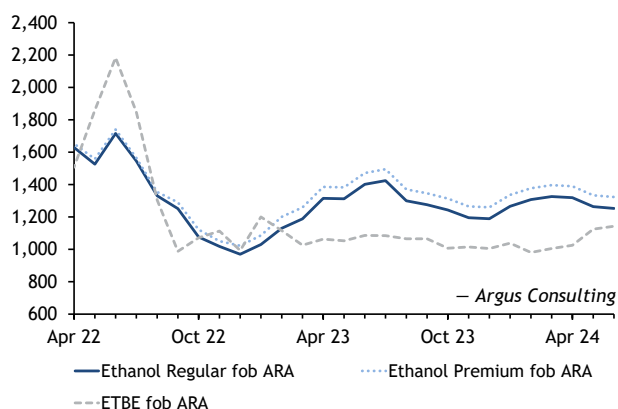


### January's ETBE price rally short-lived

ETBE prices in February fell by 7pc from a month earlier, to \$1,116/t, as prices corrected from January's strong 21pc month-on-month growth. ETBE is losing popularity as a premium blending component in France and Germany owing to a growing reluctance from customers to pay more at the pump, while ETBE's lower greenhouse gas emissions savings mean obligated blenders can obtain better incentives through using ethanol alone. We forecast that prices are unlikely to rise above \$1,100/t again this year, averaging \$1,070/t over the next two quarters and \$1,010/t in the final quarter of this year.

### European ethanol and ETBE prices

\$/t



European price outlook											\$/t
Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
Crop-based biodiesel											
FAME 0 fob ARA	1,351	1,328	1,439	1,462	1,485	1,517	1,488	1,484	1,546	1,567	1,476
FAME -10 fob ARA	1,645	1,530	1,509	1,521	1,535	1,558	1,538	1,528	1,654	1,769	1,546
Advanced FAME 0 fob ARA	1,700	1,598	1,714	1,788	1,858	1,980	1,875	1,977	1,995	2,050	2,073
PME fob ARA	1,252	1,250	1,222	1,247	1,316	1,394	1,319	1,346	1,125	1,111	1,181
RME fob ARA	1,678	1,552	1,516	1,527	1,540	1,562	1,543	1,533	1,666	1,792	1,554
SME fob ARA	1,444	1,399	1,471	1,500	1,513	1,535	1,516	1,506	1,624	1,606	1,533
Waste-based biodiesel											
Ucome fob ARA	1,632	1,564	1,651	1,709	1,762	1,830	1,767	1,814	1,812	1,840	1,853
TME fob ARA	1,578	1,517	1,602	1,657	1,709	1,775	1,714	1,759	1,757	1,785	1,797
UCO cif ARA	1,129	1,111	1,176	1,220	1,261	1,281	1,254	1,270	1,268	1,288	1,297
HVO											
HVO Class I fob ARA	2,349	2,310	2,327	2,218	2,131	2,075	2,141	1,902	1,883	1,944	2,072
HVO Class II fob ARA	2,507	2,326	2,476	2,483	2,499	2,540	2,507	2,506	2,697	2,773	2,806
HVO Class III fob ARA	2,566	2,394	2,547	2,538	2,525	2,524	2,529	2,361	2,254	2,226	2,357
SAF											
SAF fob ARA	3,332	3,225	3,433	3,435	3,442	3,476	3,451	3,358	3,446	3,339	3,180
Bionaphtha											
Bionaphtha fob ARA	2,568	2,524	2,479	2,504	2,533	2,563	2,533	2,541	2,635	2,683	2,704
Ethanol											
Ethanol Regular fob ARA	1,030	1,130	1,189	1,315	1,312	1,401	1,343	1,333	1,209	1,300	1,279
Ethanol Premium fob ARA	1,086	1,201	1,259	1,386	1,383	1,472	1,413	1,404	1,280	1,370	1,349
ETBE fob Rotterdam	1,200	1,116	1,026	1,063	1,053	1,086	1,067	1,072	1,009	1,008	1,098



## Fundamentals

### Agriculture

#### Strong supply, low demand weigh on rapeseed prices

Rapeseed prices averaged \$593/t from 1-23 February, before plummeting to \$564/t on 1 March. This was a 10pc fall from prices at the beginning of last month, and more significantly is the lowest recorded price since February 2021.

Rapeseed availability in the EU has continued to increase in the past weeks and record imports of 7.4mn t for the 2022-23 marketing year are expected. This is anticipated to result in end-of-season stocks of 2.5mn t, which would be an 11-year high. Sufficient supply this marketing year should translate into higher availability going into 2023-24, but in the short term prices will come under pressure from waning demand in a well-supplied market.

#### Corn price decline limited

Corn prices on the Euronext exchange have reversed all their gains from late January to mid-February, and are trading close to €270/t. No new issues have arisen in the market and the risk premium related to uncertainty over the continued operation of the Ukrainian grain corridor is gradually fading. The possible extension of the export corridor to the port of Mykolaiv will be closely scrutinised as it would boost loading capacity even if pre-conflict levels have almost been reached now. This would undoubtedly explain the possible drop in end-of-season corn stocks in Ukraine that could appear in this month's US Department of Agriculture (USDA) report.

The view of Argus' agriculture analytics arm Agritel is that European corn prices are unlikely to draw significant support from uncertainty regarding the renewal of the Ukraine grain corridor. But drought in Argentina, the lack of rainfall in France

and the approach of the opening of planting in the US are all elements of uncertainty capable of limiting price decline.

#### European wheat prices dragged down by Russia

Russian wheat prices accelerated their losses, falling to \$287/t fob and dragging European wheat into a downward spiral. European wheat imports are at a record 10mn t for all grades as untaxed volumes are coming from Ukraine. New Russian criticism of the Ukrainian export corridor allowed a slight rebound in prices at the end of last week, although operators remain largely optimistic of exports continuing. But the corridor agreement renewal date of 18 March is fast approaching and without an official declaration of renewal, the geopolitical risk premium could return.

### Fossil fuel demand and prices

#### Demand from gasoline blending sector still strong

The gasoline crack spread in northwest Europe dropped by \$1.50/bl to an average of \$14.30/bl in February, following a rise in stocks. European exports fell under pressure from higher freight rates and weaker import demand from the US, where refinery utilisation rates have gradually increased.

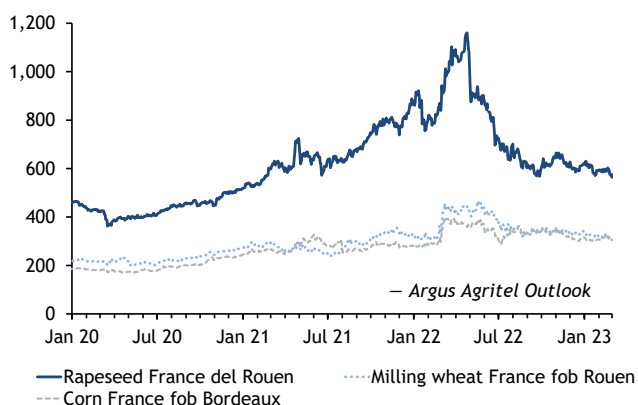
Northwest Europe naphtha crack spreads rose for an eighth consecutive month in February, to a \$2.20/bl discount to North Sea Dated crude, up by \$3.60/bl from January. Petrochemical demand remains weak in Europe, but demand from the gasoline blending sector is still strong as the wide gasoline-naphtha spread continues to incentivise refiners to blend naphtha into gasoline. This is likely to continue in the near term, maintaining support naphtha prices.

#### High stocks weigh on crack spreads after embargo

Ample supplies depressed middle distillate crack spreads across the main refining regions in February, at a time of sluggish demand. Diesel crack spreads fell after the EU embargo

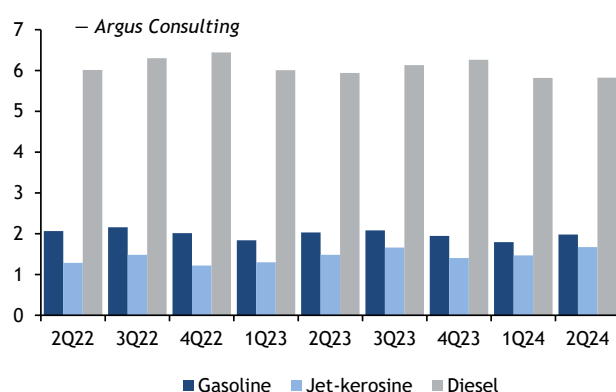
#### Biofuel agricultural feedstock prices

\$/t



#### European fuel demand

mn b/d



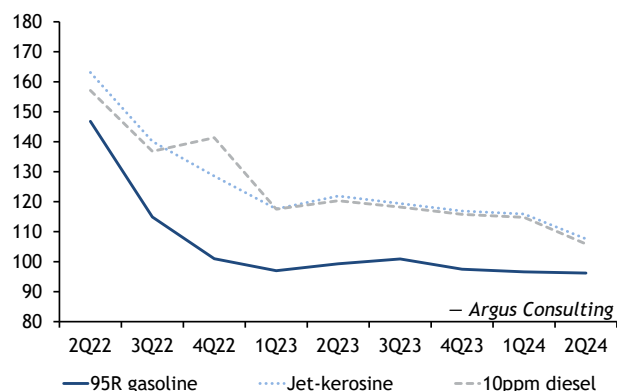
on Russian product imports came into effect on 5 February because of high inventories. But with Europe now relying on diesel supplies from east of Suez to meet 30pc of its demand, any change in east-west trade flows and arbitrage economics could make diesel crack spreads more volatile.

Diesel crack spreads in northwest Europe fell to an average of \$29.20/bl in February from January's \$44.10/bl, mainly because of high import availability, which led to a build-up in inventories. Buyers in Europe rushed to fill storage in preparation for the loss of Russian diesel supplies, which averaged 600,000 b/d last year.

We expect diesel supplies in Europe to tighten again towards April as European inventories drop because of the structural diesel shortfall, which should pave the way for diesel crack spreads in Europe to strengthen. In addition, the recovery of

### European fuel prices

\$/bl



construction activity in China, which typically boosts diesel consumption, could limit the amount of diesel available to be diverted to Europe.

## NORTH AMERICA

### Summary

#### This month

US D4, D5, and D6 RIN credits dipped slightly at the start of February. But prices rebounded to end of January levels as industry comments on US environmental regulator the EPA's proposed Renewable Fuel Standard (RFS) for 2023-25 filed in, urging an increase in requirements. D3 credits saw a larger fall in February, but similarly ended the month showing signs of recovering to end of January levels. eRINs remain a controversial topic — in written comments to the EPA, electric vehicle (EV) manufacturers supported the eRINs proposal, citing its potential to increase demand, while obligated parties under the RFS opposed the measure.

#### Next month

Biodiesel prices fell in February, but we anticipate that prices are going to increase slightly in March and into April for some grades. Renewable diesel (RD) prices are expected to fall slightly as new plants start up.

#### 3-6 months ahead

We expect RIN prices to continue to drop from current levels, with D4 prices to fall below \$1.50/RIN in the coming quarter, and the D4-D6 spread to remain narrow. California Low Carbon Fuel Standard (LCFS) prices will remain on a bearish trend.

#### 6-12 months forward

We expect RIN prices to start to bounce back in June as the EPA digests industry comments and releases its finalised renewable volume obligation (RVO) targets, which could be higher than currently proposed. RD demand is expected to rise steadily from August as more capacity comes on line. Ethanol demand is forecast to hold stable this year as no major changes are anticipated for gasoline consumption.

### Regulation

#### US senators explore national LCFS

The Senate Environment and Public Works Committee has discussed a national Clean Fuel Standard similar to programmes along the US west coast that require steady reductions to gasoline and diesel carbon intensity. But neither chamber in Congress has proposed specific legislation so far. The committee has cited cost containment, predictability and a wider array of supported fuels in state LCFS programmes as

reasons to examine a potential federal standard, but members have argued that such a scheme would increase fuel costs or disproportionately favour electric vehicles. The EPA has not seen a way to shift the existing RFS programme to behave more like an LCFS.

#### Washington works on LCFS participation fee; SAF bill

Washington regulators have proposed fees for companies supplying fuels to the state under its new Clean Fuel Standard. Based on 64 companies currently registered, the fee would result in refiners, importers and other obligated parties paying more than \$77,000 and low-carbon fuel suppliers almost \$2,300 to participate in the LCFS market this year.

The state is also reviewing a bill aimed at expanding and incentivising sustainable aviation fuel (SAF) production and consumption. The bill has received bipartisan political support and industry backing and would give SAF producers in Washington with a capacity of at least 20mn USG/yr by 1 July 2024 a \$1/USG tax credit.

#### New Mexico makes third attempt to introduce LCFS

New Mexico legislators have advanced proposed low-carbon transportation fuel incentives for a third consecutive session. This year's LCFS effort faces arguments similar to those that stymied previous measures in the preceding two annual legislative sessions. The bill would direct state environmental regulators to establish a New Mexico Clean Fuel Standard targeting a 20pc reduction from 2018 transport fuel carbon intensity by 2030, and at least 30pc by 2040.

### Demand

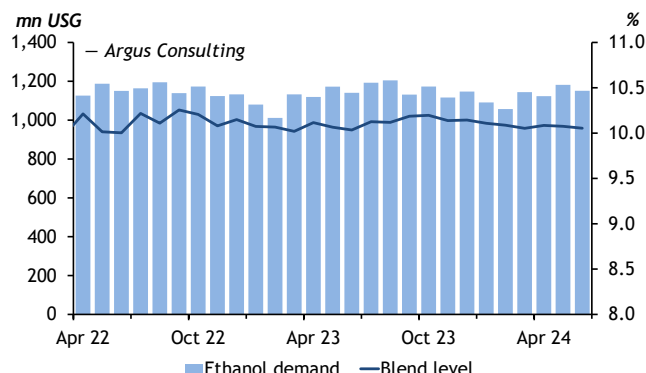
#### Ethanol

##### Ethanol demand flat in December

US ethanol demand dropped on a daily average basis between November and December, from 892,000 b/d to 870,000 b/d, but outright demand was similar in both months at around 1.13bn USG, while the overall blend level increased to 10.15pc from 10.08pc. January ethanol demand is estimated at 830,000 b/d (1.08bn USG), in line with seasonal expectations as January volumes typically represent the low point for the year.

We forecast US ethanol demand at 860,000 b/d (1.01bn USG) in February. We expect gasoline demand to rise steadily in

## US ethanol demand and blend level



the coming months. Blend levels are expected to drop in January to 10.07pc, remain steady in February and decrease further in March, to 10.02pc.

## Renewable diesel

### Demand to drop in February, bounce back in March

US RD consumption remained relatively unchanged in January at 166mn USG, similar to December levels. RD imports increased by 36pc to 670,000 bl (28mn USG) in December, according to the EIA. February demand is projected to fall to 155mn USG with an expected overall blend rate of 3.36pc, with consumption forecast to recover to January levels in March at 167mn USG.

RD demand will inevitably pick up during the year, and is expected to continue increasing from August as additional capacity is due to come on line. Notably, refiner PBF Energy's 20,000 b/d RD plant in Chalmette, Louisiana, is now expected to start up by the end of March.

## Biodiesel

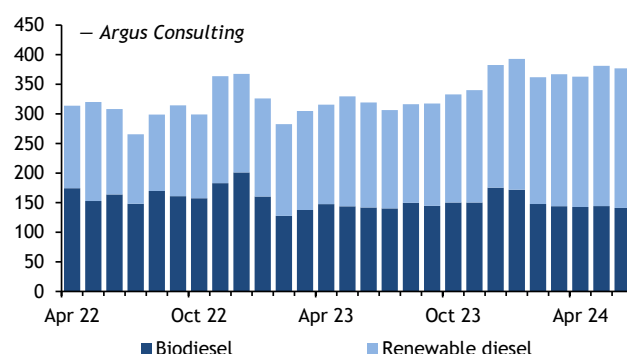
### D4 RIN generation rises

Biomass-based diesel D4 RIN credit generation reached 522mn in January, a 47pc increase compared with a year earlier, outpacing growth in all other credit types. About 422mn of the 522mn D4 RIN credits came from RD and bio-diesel produced domestically, while 33mn credits came from imported product, and only 161,500 credits from SAF. Total RIN generation surpassed 1.75bn credits in January, down by 196mn from December.

Previous year RIN generation data show that 2022 D6 RIN generation fell 716mn credits short of the mandated 15.25bn credits required.

## US biodiesel and RD consumption

mn USG



### Demand falls in January, stocks rise

US biodiesel demand dropped to 160mn USG in January owing to colder weather, with a blend rate of 3.2pc. We estimate that blend rates dropped to 2.79pc in February, leading to overall biodiesel consumption of 128mn USG, which is forecast to increase to 138mn USG in March.

Biodiesel and RD stocks grew to just over 7mn bl in December, up by around 7pc from a year earlier, according to the EIA.

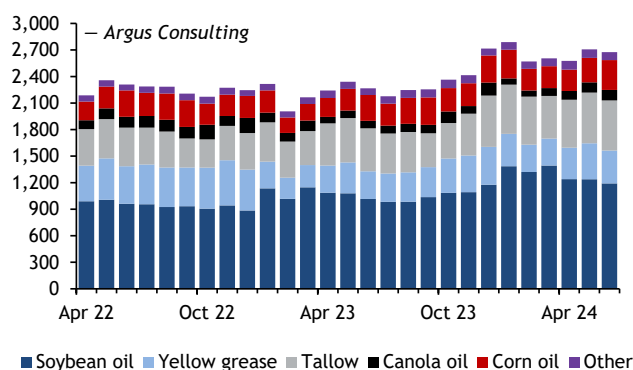
## Feedstocks

### Feedstock demand mixed as RD grows

RD and biodiesel feedstock demand was largely steady between November and December, falling to 2.25bn lbs from 2.27bn lbs. Soybean oil (SBO) consumption was substantially lower than what we forecast for December, making it apparent that demand during the month did not follow the seasonal trend suggested by historical data. An increase in canola oil, tallow and corn oil consumption almost offset the decline in demand for SBO and yellow grease. Canola oil saw

## US biodiesel and RD feedstocks demand

mn lbs



the largest percentage increase in demand, rising by 50pc from November, while yellow grease demand fell by almost 10pc month on month. On a year-on-year basis, consumption of SBO and corn oil fell by 5.6pc and 17pc, to 885mn lbs and 249mn lbs, respectively, in December.

We estimate that total feedstock consumption will have increased to 2.32bn lbs in January, dropping to 2.01bn lbs in February before recovering to 2.16bn lbs in March. There were reports in February of a 280,000 bl shipment of used cooking oil (UCO) from China to New Orleans.

#### US biofuel demand outlook

Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
Biofuel <span style="float: right;">mn USG</span>											
Ethanol	1,080	1,012	1,133	1,119	1,172	1,141	3,433	3,529	3,437	3,292	3,456
Biodiesel	160	128	138	148	144	142	433	435	476	464	428
Renewable Diesel	166	155	167	168	186	177	531	506	580	658	693
<b>Total</b>	<b>1,406</b>	<b>1,294</b>	<b>1,437</b>	<b>1,435</b>	<b>1,502</b>	<b>1,460</b>	<b>4,397</b>	<b>4,469</b>	<b>4,492</b>	<b>4,414</b>	<b>4,577</b>
Biodiesel and renewable diesel feedstocks <span style="float: right;">mn lbs</span>											
Canola oil	109	97	118	72	85	85	242	276	364	228	331
Corn oil	251	175	188	214	244	291	749	852	829	818	855
Soybean oil	1,136	1,017	1,147	1,086	1,080	1,016	3,182	3,004	3,355	4,099	3,670
Tallow	444	408	384	477	502	485	1,464	1,292	1,454	1,580	1,683
Yellow grease	303	239	252	307	349	313	969	992	1,230	981	1,134
Other	73	70	75	84	81	76	241	262	264	259	286
<b>Total</b>	<b>2,316</b>	<b>2,006</b>	<b>2,164</b>	<b>2,241</b>	<b>2,340</b>	<b>2,267</b>	<b>6,848</b>	<b>6,677</b>	<b>7,496</b>	<b>7,965</b>	<b>7,960</b>

## Credits

### RINs/RVO

#### February RIN prices on a V-shaped curve

D4 RIN prices started February at 159.25 ¢/RIN, recorded a month low on 6 February at 155.75 ¢/RIN, rebounding to end the month at 162¢/RIN. D5 credits tracked D4 at a 1¢/RIN discount throughout the month. Similar to D4 and D5 prices, D6 prices started at 156¢/RIN on 1 February, dipped to a February low of 152¢/RIN on 6 February, before recovering to end the month at 158.25¢/RIN.

The 2023 vintage D4-D6 spread increased on the month, rising to 3.55¢/RIN on average in February from a January average of 2.80¢/RIN.

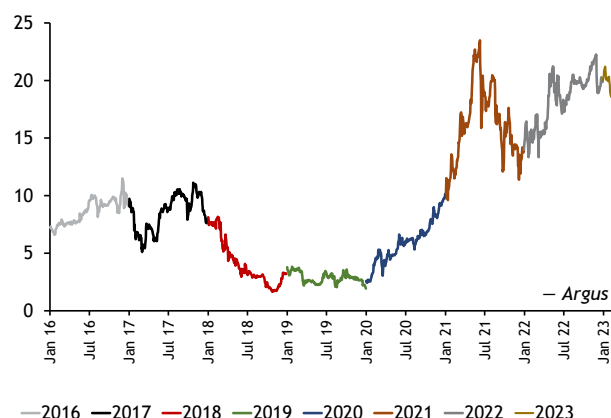
The Argus RVO dropped to 18.58¢/USG on 6 February, its lowest recorded value this year, but ended the month at 19.35¢/USG. The RVO averaged 19.38¢/RIN last month, a 5pc decline compared with the January average.

#### US EPA SRE denials under fire

A court ruling in late January froze compliance obligations for two refineries, potentially granting the provision of two small

#### Argus RVO

¢/USG

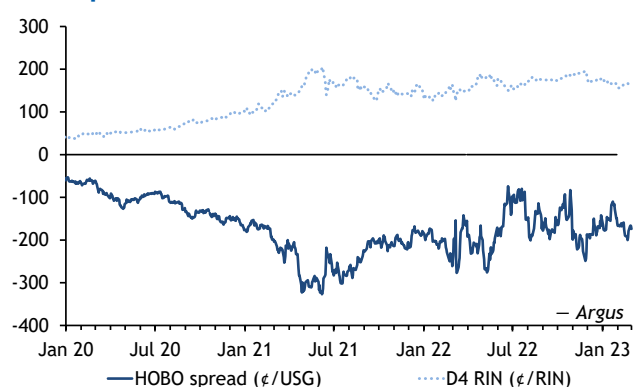


refinery exemptions (SREs). If the courts side with the plaintiffs, it could leave the door open for more small refineries to seek waivers absolving them of their RFS obligation. The granting of additional SREs would most likely have the largest effect on D6 RIN demand compared with other RIN types.

#### D3 credits decline

D3 prices averaged 195¢/RIN during February, dropping from 218.03¢/RIN in January. Similar to other RIN types, D3 credits fell to their lowest on 6 February at 188¢/RIN before recovering to end the month at 196.50¢/RIN.

### HOBO spread vs D4 RIN



eRINs remain a controversial topic. In written comments to the EPA, EV manufacturers outlined their support for the eRINs proposal, citing its potential to increase demand, while RFS obligated parties were opposed to the measure. Refiners claim that the programme will raise costs throughout the downstream value chain, with lobbying groups drawing attention to potential problems involving biogas being double counted, as it functions as both a fuel for generating RINs as well as a feedstock for RIN-creating biofuels.

## LCFS

### LCFS target review triggers brief rally

California LCFS credits surged in February as regulators discussed 50pc tougher reduction targets and changes to the fuels that would qualify to produce credits and deficits. Credits rose to a five-month high on the morning of the workshop discussion on 22 February, before returning over the following three sessions to a \$60-70/t trading range, closing the month at \$66/t. Regulators plan to implement changes to the programme in 2024.

### California LCFS transfers set January record

Completed California LCFS credit transfers set a January record, according to the latest state data. The state reported 4.6mn t of credits across 470 transfers finished, 35pc higher

California LCFS forward prices					\$/t
Month	4Q22	1Q23	2Q23	3Q23	4Q23
Dec	66.86	66.95	67.01	67.29	
Jan		64.28	64.40	64.90	65.30
Feb		64.60	64.79	65.16	65.47

compared with the same month a year earlier. California also reported a 41pc increase in completed forward transfers in January compared with December.

### Oregon still at a premium to California

Oregon Clean Fuels Program (CFP) credits remained steady throughout February, averaging \$122.16/t and closing at \$122.50/t. Oregon credits remain at a wide premium to California LCFS credits. Oregon CFP transfer volumes hit a record in January of more than 212,000t across 41 transfers.

### Oregon draws down CFP credits

Low-carbon fuel supplies could not keep pace with new Oregon CFP deficits during the third quarter of 2022, according to the latest state data. The third consecutive quarterly draw on unused credits may mean that participants will empty the low-carbon fuel standard's reserve of available credits faster than originally thought. The implied number of credits available for compliance with the CFP fell by 15pc from the previous quarter to less than 600,000t, according to data released by the Oregon Department of Environmental Quality.

New deficits increased by 13pc during the third quarter, while new credits fell by 1.7pc. Rising, although not record, consumption of RD and high-ethanol blends of gasoline could not offset a sharp drop in biodiesel credits. Meanwhile, deficits built up on higher gasoline and diesel consumption.

Oregon last year updated its CFP to target a 20pc reduction in 2015 transport fuel carbon intensity by 2030 and a 37pc reduction by 2035, replacing a previous 10pc target for 2025.

US RIN price outlook							\$/RIN
Category	Jan 23	Feb 23	Mar 23	2Q23	3Q23	4Q23	1Q24
D4	1.69	1.62	1.60	1.48	1.52	1.56	1.51
	▼	▼	▼	▼	▲	▲	▼
D6	1.67	1.59	1.56	1.43	1.46	1.51	1.45
	▼	▼	▼	▼	▲	▲	▼



## Prices

### Ethanol

#### Prices track CBOT futures losses

US ethanol prices averaged slightly lower in February than January. Prices at the Chicago Argo terminal were \$2.13/USG on 1 February, averaging \$2.17/USG for the month, down by 1¢/USG from January. The Chicago Argo terminal price was lowest at the end of the month, finishing it at \$2.11/USG. US Gulf coast prices followed suit, dropping to \$2.31/USG in February from \$2.33/USG in January.

We forecast US ethanol prices at the Chicago Argo terminal and at the Gulf coast to average \$2.07/USG and \$2.21/USG, respectively, this month, increasing to \$2.15/USG and \$2.29/USG in April.

US ethanol production was at 1mn b/d for the first week of February and remained above that for the rest of the month, but was down by around 25,000 b/d compared with the last week of January. Domestic ethanol stocks rose to their highest so far this year at 25.8mn bl in the third week of February, but dropped to 24.8mn bl the following week.

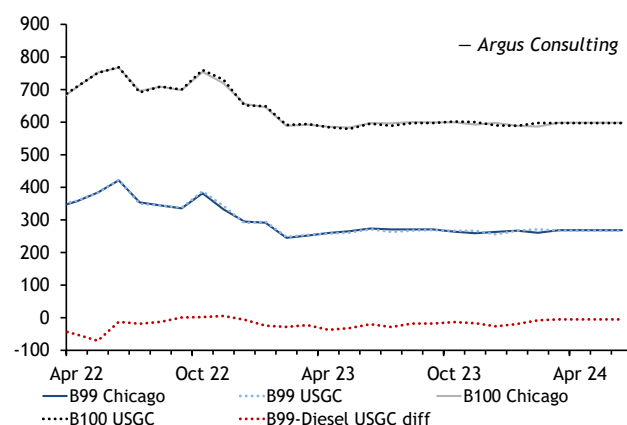
### Biodiesel

#### Biodiesel prices drop from previous month

Chicago and US Gulf B99 average prices both fell by 47¢/USG compared with January, to \$2.45/USG and \$2.48/USG respectively, last month. We forecast Chicago B99 prices to rise slightly by 7¢/USG in March to average \$2.52/USG, and increase steadily across the second quarter. US Gulf coast B99 prices are expected to average \$2.54/USG in March and follow a similar trend to Chicago prices.

#### US biodiesel prices

¢/USG



### Renewable diesel

#### RD margin rises to highest since October

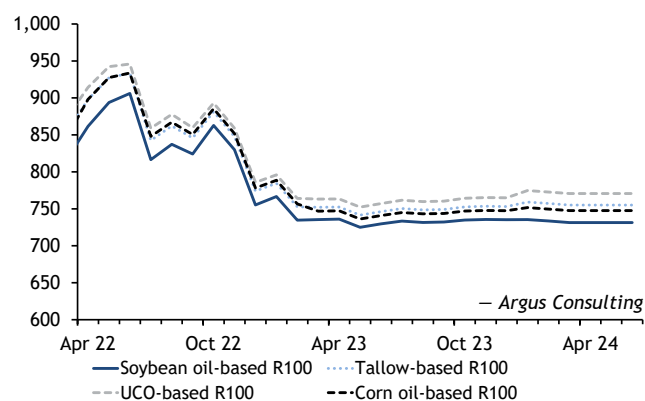
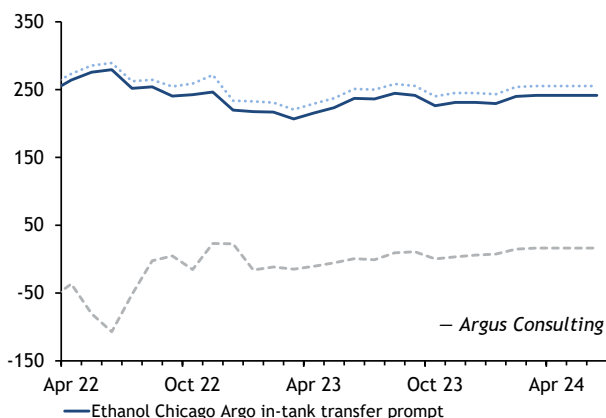
RD recorded its highest margin since October on 14 February at \$2.48/USG, with the average margin for the month increasing to \$2.26/USG from \$1.88/USG in January. UCO finished February as the RD feedstock providing the highest return. R100 monthly prices in February averaged \$7.35/USG for SBO-based R100, \$7.53/USG for tallow-based product, \$7.57/USG for corn oil-based product, and \$7.64/USG for UCO-based RD.

Forecast average prices for March are similar to February levels, with SBO-based R100 remaining at \$7.35/USG and tallow-based product just 1¢/USG lower on the month at \$7.52/USG. UCO-based RD will also drop by 1¢/USG compared with February to \$7.63/USG in March, although corn oil-based product will be 10¢/USG lower at \$7.47/USG. Given the RD capacity due to come on line this year and the modest growth in the regulatory framework, prices are unlikely to return to the \$8-9/USG range of mid-2022.

#### US ethanol prices

#### US renewable diesel prices

¢/USG



## Feedstocks

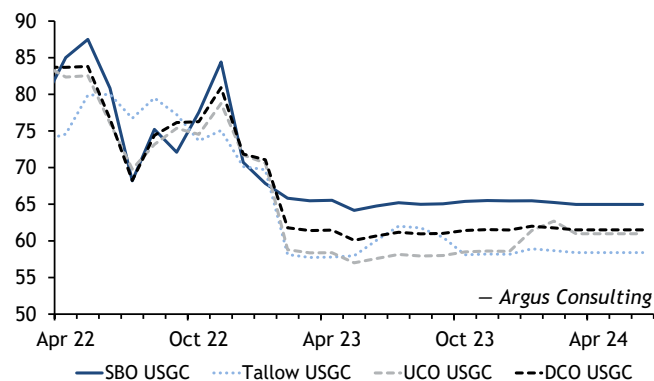
### Renewable feedstocks prices drop

February feedstock prices for biofuel posted significant decreases from January, except for SBO, which fell by only 3pc, compared with a 13pc fall for distillers corn oil (DCO) and 17pc for tallow and UCO. Feedstock prices continued their declining trend from January, as SBO prices averaged 65.8¢/lb at the Gulf coast, the lowest since January 2022.

Prices in March are forecast to remain similar to those in February, with SBO at 65¢/lb, tallow and UCO at 58¢/lb, and DCO at 61¢/lb.

### US biofuel feedstock prices

¢/lb



### US biofuel price outlook

Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
Ethanol											¢/USG
Ethanol Chicago Argo in-tank transfer prompt	218	217	207	215	223	237	225	241	230	237	241
Ethanol USGC barge/rail fob Houston	233	231	221	229	237	251	239	255	243	251	254
Biodiesel											¢/USG
B99 SME Chicago in-tank transfer Argo	292	245	252	260	266	274	266	271	262	265	268
B99 SME fob Houston rail/barge	295	248	254	258	261	272	264	267	263	269	263
B100 SME Chicago in-tank transfer Argo	646	588	592	586	583	597	589	599	597	591	606
B100 SME fob Houston rail/barge	649	591	594	584	579	595	586	595	597	594	600
Renewable diesel											¢/USG
R100 (soybean oil-based) del California	767	735	735	736	725	730	730	732	735	733	727
R100 (UCO-based) del California	796	764	763	763	752	757	758	761	765	773	768
R100 (tallow-based) del California	785	753	752	753	741	746	747	749	753	757	752
R100 (corn oil-based) del California	789	757	747	747	736	741	741	744	747	750	744
Feedstocks											¢/lb
Soybean oil crude de-gummed US Gulf coast del rail	68	66	65	66	64	65	65	65	65	65	64
UCO US Gulf coast del rail	71	59	58	58	57	58	58	58	59	62	59
Tallow bleached fancy US Gulf coast del rail	70	58	58	58	58	60	59	61	58	59	60
Distillers corn oil US Gulf coast del rail	71	62	61	61	60	61	61	61	61	62	61

## Fundamentals

### Agricultural prices

#### Soybean futures rise on harvest lags

Dry weather in Argentina during most of February led to lower soybean production projections from the Buenos Aires Grain Exchange and the US Department of Agriculture (USDA). Market players were left concerned as the country is a major soybean exporter. *Argus* expects Argentina's 2022-23 soybean production at 32.6mn t, the lowest since 2008-09.

Brazil's soybean harvest was 34pc complete as of 25 February. Mato Grosso, Brazil's largest soybean producing state, had 77.1pc harvested by this date, adding some downward pressure to US SBO futures. These pressures saw US SBO futures fall by 3.5pc in the week to 24 February. CBOT SBO futures for the current month settled at 60.83¢/lb at the start of March, up by 0.79¢/lb from the previous session, while May CBOT SBO futures settled at 60.45¢/lb, down by 0.74¢/lb.

#### Lack of new demand weighs on wheat prices

Wheat prices remain under pressure in the absence of new demand. In Chicago, the rebound of corn and soybean prices against the backdrop of drought in Argentina allowed wheat to stay at around \$7/bushel. Winter wheat has also benefited from high rainfall, but its condition remains below normal.

#### South America output woes support US corn exports

Doubts that US corn exports would reach the USDA's 48.9mn t annual target could be helped by the situation in South America. In Argentina, only 6pc of the corn crop is in good condition owing to severe drought. In Brazil, planting delays are still affecting the south of the country, and progress is well behind long-term averages. *Argus* estimates the potential production loss at up to 9mn-10mn t compared with current expectations. But Mato Grosso state is catching up and 89pc of field work

is now completed, although still behind the typical 94pc by this time of year. And better weather in northern Brazil has enabled an increase in the pace of planting.

We expect US corn exports to increase and to reach the USDA's targets in March-April. Looking out to 2023-24, we forecast US corn acreages at 91.5mn acres (370,287km<sup>2</sup>), close the USDA's baseline of 92mn acres.

### Fossil fuel demand and prices

#### Cold spell sees demand fall and stocks rise

US gasoline demand was around 8.1mn b/d in January, a decline of almost 300,000 b/d from December and an almost two-year low. The second bitterly cold spell of the winter across the northeast US meant that many people were forced to shelter indoors, reducing mobility and eroding transport fuel demand. Gasoline inventories rose sharply, by 14mn bl in January, as weak demand allowed stocks to build.

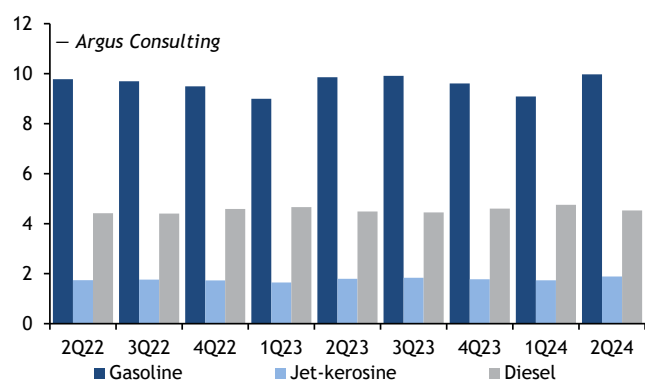
Looking ahead, we expect gasoline demand in the US to be relatively steady this year at 8.8mn b/d, just 20,000 b/d higher than last year. Gasoline demand growth faces barriers from increasing biofuels mandates, rising fuel efficiency standards and competition from electric vehicles.

#### Refiners increase jet fuel yields at expense of diesel

Jet fuel stocks increased by 1.6mn bl month on month in January, but remain significantly below their average for 2015-19. Jet fuel demand continued to recover steadily last year from the lows seen at the height of the pandemic. This recovery in consumption has been forcing refiners to increase jet fuel yields at the expense of diesel, just as the European market has banned Russian diesel imports and starts to seek out alternative sources of the fuel. This is resulting in both jet fuel and diesel stocks remaining at large deficits to their five-year averages.

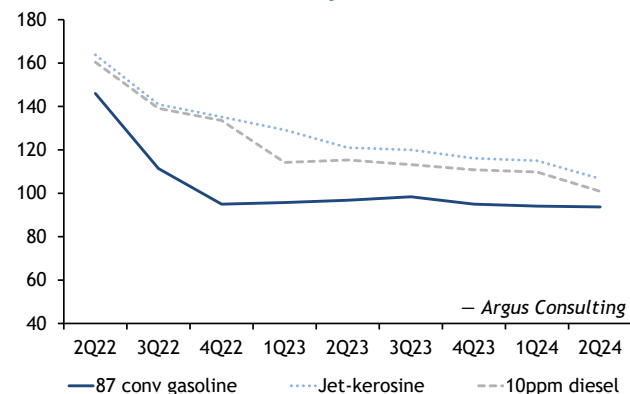
North America fuel demand

mn b/d



North America (USGC) fuel prices

\$/bl



## SOUTH AMERICA

### Regulation

#### Ethanol import tariff restored in March

Brazil has reinstated its tariff on ethanol imports to protect its domestic industry from lower-priced imports after a decision from Brazil's executive trade policy council Camex. The move comes after the previous government reduced the tariff to zero on 23 March 2022 to tame double-digit annual inflation and lower retail gasoline prices, as anhydrous ethanol makes up 27pc of retail gasoline's sales volumes, but the move had little impact on imports. Initially reinstated at 18pc, Camex has since trimmed import duties to 16pc.

#### Brazil ponders pending biodiesel mandate hike

Details of the change in Brazil's biodiesel blending mix expected for April may be revealed in the coming weeks, as the country's recently elected government designates a new board of ministries for its national energy policy Council (CNPE). Biodiesel mandatory blend rates were cut to 10pc for January-March from 13pc in 2022, with CNPE's current schedule calling for an increase to 15pc in April. But the planned rise is a cause of concern to fuel distributors and biodiesel producers, who fear it may lead to higher costs and fuel prices.

#### Brazil may stick to later carbon credit deadline

The nine-month delay to Brazil's deadline for carbon credit acquisition goals for 2022 is likely to be respected, according to sources at Brazil's mines and energy ministry. The deadline was extended last year from December 2022 to September 2023. A further change to the deadline risks drawing legal challenges from fuel distributors, government sources say, noting that the country's national biofuels policy Renovabio has been a potential target for court action because of the significant rise in the price of Cbio decarbonisation credits.

### Demand

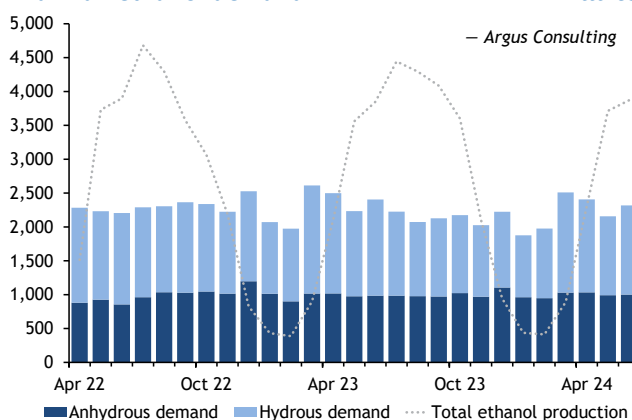
#### Ethanol

#### Hydrous appetite fails to lift February demand

Brazilian ethanol demand declined to 2.07bn litres in January from 2.53bn litres in December, an 18pc month-on-month reduction. The larger share of this decrease was in hydrous ethanol consumption, which fell by 20pc to 1.06bn litres from 1.33bn litres. Anhydrous ethanol demand fell by 15pc from a month earlier to just over 1bn litres in January.

Brazilian ethanol demand

mn litres



More broadly, we expect total Brazilian ethanol demand to have shrunk in February, despite an increase in appetite for hydrous ethanol, as many distributors returned to the spot market and mills reportedly traded significant volumes. The recent announcement that Petrobras would lower refinery gate diesel but not gasoline prices should also have increased demand for the grade. In contrast, anhydrous ethanol demand, which tracks gasoline, is anticipated to have fallen by 11pc, pulling total ethanol demand lower.

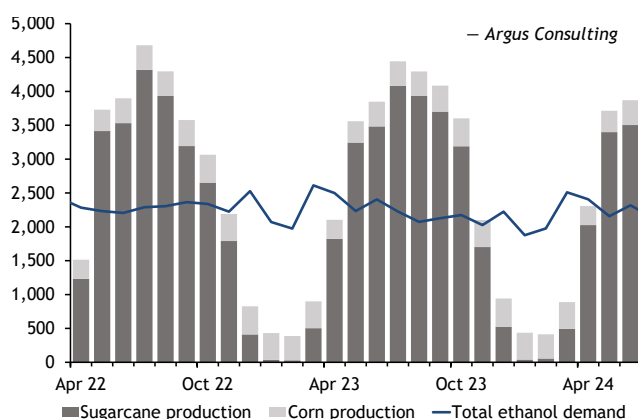
#### Production slips awaiting new harvests

The end of the sugarcane harvest season saw total ethanol production almost halve in January to 431mn litres, a 47pc drop from December output. But January ethanol production was 41pc higher on the year, as sugarcane-based output continued until later in the season.

The overall year-on-year rise was also driven by an increase in corn ethanol production, which was 30pc higher than a

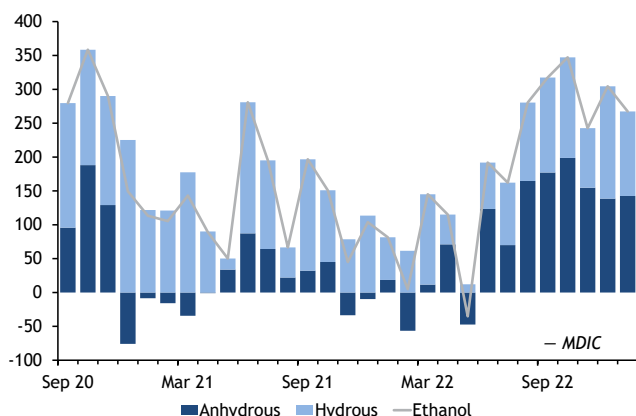
Brazilian ethanol production

mn litres



Brazilian net ethanol exports

mn litres



year earlier in January. Corn still represents a small portion of ethanol feedstock in Brazil, but several plants produce from corn in the inter-harvest period, while others have steady supply throughout the year. We forecast similar levels of corn ethanol production over the next couple of months and expect sugarcane ethanol output to exceed December levels in March, as more plants should be operating ahead of the official start of the 2023-24 harvest season on 1 April.

### Brazil net ethanol exports surge in January

Brazil's net ethanol exports rose more than threefold in January from a year earlier, as shipments to the EU, South Korea and a few other countries helped replace the US market, which was closed off last year by unfavourable arbitrage economics. Net ethanol exports in January increased to 267mn litres from 81mn litres a year earlier, although they were down by 12pc from 304mn litres in December. Anhydrous ethanol accounted for 53pc of net exports against 47pc hydrous. Net anhydrous ethanol exports rose by 3pc in January, while net hydrous ethanol exports dropped by 25pc. Net ethanol exports are typically at their lowest in the first quarter.

Brazil's ethanol imports dropped by 68pc in January from a month earlier, totalling just over 5mn litres. Almost all ethanol imported during the month came from Paraguay.

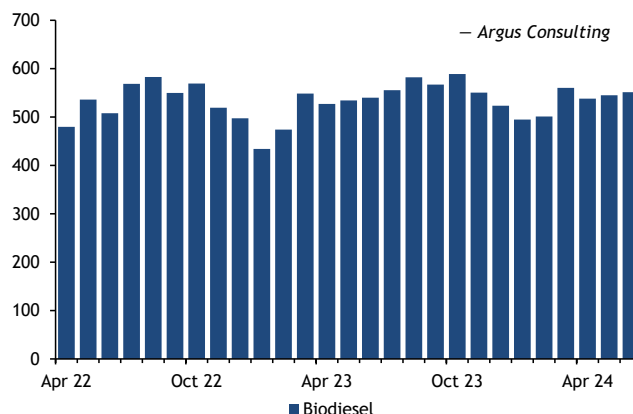
## Biodiesel

### Sales weaken further in January

Brazil's biodiesel consumption fell to 434mn litres in January from 497mn litres in December — a 13pc decline. This came at a time where national and regional retailers signalled to facilities that they expected to collect lower biodiesel volumes in January and February as blended diesel sales at the pump remained weak. The average blend ratio in January of 9.8pc was 0.3 percentage points lower than in December.

Brazilian biodiesel demand

mn litres



We estimate that Brazil's biodiesel demand will have recovered to 474mn litres in February, a 9pc increase compared with January. Looking forward, we expect demand to increase substantially in March — by 16pc compared with February to 549mn litres — but the forecast for the remainder of the year remains heavily dependent on the expected revision to the overall blend rate, which is currently at 10pc but is likely to be raised.

## Feedstocks

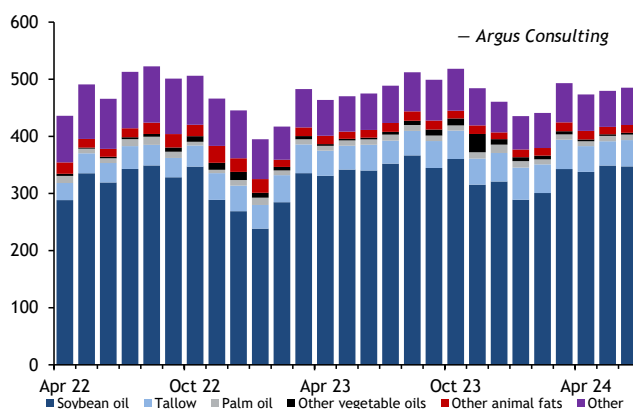
### January demand slump to reverse in February

Soybean oil (SBO) represented 60pc of biodiesel feedstock volumes in January, holding fairly consistent with the December share. But outright SBO demand dropped by 12pc in January, to 238,000t from 269,000t, tracking the month-on-month declines in diesel and biodiesel consumption.

Tallow represented 11pc of feedstock volumes in January, up by half a percentage point from December. Demand for tallow fell to 42,000t in January from 45,000t a month earlier. Conversely, palm oil demand rose in January, to 13,000t from

Brazilian biodiesel feedstock demand

'000t



10,000t in December, increasing its share of Brazil's biodiesel feedstock volumes to 3.2pc. Demand for other vegetable oils declined to 9,000t from 14,000t between December and January, whereas consumption of other animal fats remained stable, at 24,000t.

We estimate that total feedstock consumption for biodiesel will have increased during February, with the main rise coming from SBO, demand for which is forecast to have grown by 20pc to 285,000t from 238,000t in January. Tallow demand is also expected to have risen in February, to 47,000t.

Brazilian biofuel demand outlook											
Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
Ethanol demand											mn litres
Anhydrous ethanol	1,014	902	1,017	1,018	976	986	2,980	2,937	3,097	2,941	3,027
Hydrous demand	1,057	1,072	1,595	1,481	1,258	1,419	4,158	3,488	3,326	3,421	3,855
Ethanol demand	2,071	1,974	2,612	2,499	2,234	2,405	7,138	6,425	6,423	6,362	6,882
Biodiesel demand											mn litres
Biodiesel demand	434	474	549	527	534	540	1,601	1,705	1,663	1,556	1,634
Feedstock demand											'000t
Soybean oil	238	285	336	331	342	340	1,013	1,064	997	933	1,034
Tallow	42	47	50	44	42	45	131	130	146	158	134
Palm oil	13	8	9	8	9	9	27	31	35	29	28
Other vegetable oils	9	6	5	3	3	3	9	23	54	19	9
Other animal fats	24	13	15	15	13	13	41	47	40	42	42
Other	70	58	67	63	62	64	188	205	192	188	192
<b>Total</b>	<b>395</b>	<b>417</b>	<b>483</b>	<b>464</b>	<b>470</b>	<b>475</b>	<b>1,409</b>	<b>1,500</b>	<b>1,463</b>	<b>1,370</b>	<b>1,438</b>

*Anhydrous ethanol: free of water and at least 99pc pure, and used in gasoline blends, currently set at 27pc. Anhydrous fuel meets all the requirements of the ASTM D4806. Hydrous ethanol: contains water and has a purity of 96pc. Can be used in Brazil as a 100pc gasoline substitute in flex-fuel vehicles.*



## Prices

### Ethanol

#### Brazil ethanol prices at a two-year low

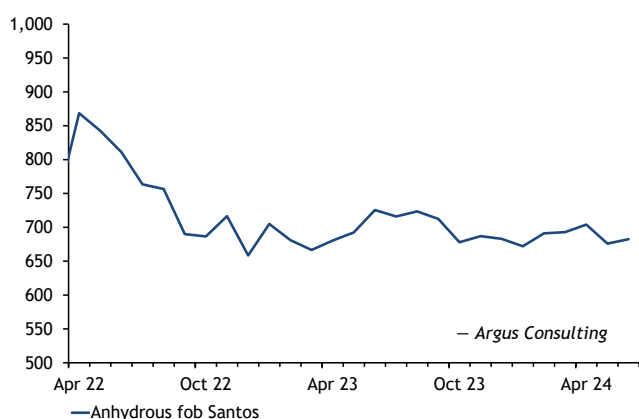
The anhydrous ethanol fob Santos monthly average price fell in February, mirroring a similar trend over the same period last year. Monthly average prices decreased by just over 3pc, to \$681/m<sup>3</sup> from \$705/m<sup>3</sup>. Prices fell by 1.7pc in local currency terms, with the real/dollar exchange rate dropping by 0.5pc over the month. The carnival holiday season encouraged some consumption but fresh demand for spot deliveries remained limited owing to relatively adequate inventories that have accumulated over the past few months. Tepid demand left suppliers with little option but to accept lower bids to ease cash flow concerns.

Prices for anhydrous corn ethanol imported from the US Gulf coast increased as front-month Chicago Board of Trade corn and ethanol values strengthened. Export quotes settled 50¢/m<sup>3</sup> higher from the previous session, reflecting a slightly wider D5-D6 RIN spread.

We expect prices to rise across March, to result in a monthly average anhydrous ethanol fob Santos price of around \$665/m<sup>3</sup>. This increase should maintain momentum throughout most of the second quarter, which will push prices closer to \$700/m<sup>3</sup>.

**Brazilian ethanol prices**

**\$/m<sup>3</sup>**



### Biodiesel

#### Argentina SME prices to come under pressure

Argentinian soy methyl ester (SME) prices fell by just over 4pc in January compared with December, dropping by \$67/t to \$1,514/t from \$1,581/t. This was followed by a further fall in February, to \$1,500/t. Prices have weakened again in the first week of March, to \$1,491/t, and we expect them to fall further in April, to a monthly average of \$1,371/t.

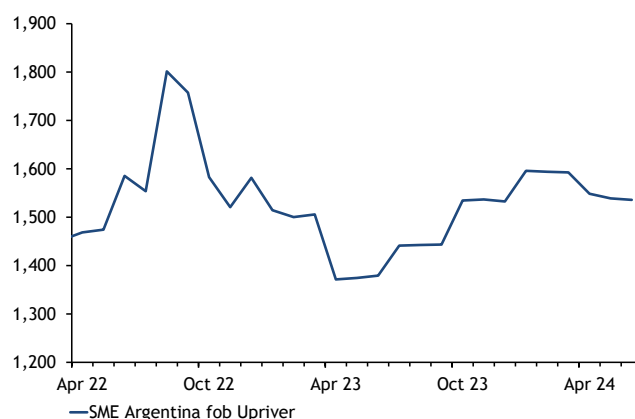
SME prices should retain some support this year as a result of stronger demand from countries that have added restrictions to the use of palm oil as a biofuel feedstock. But this could prove short-lived as other European markets consider moving away from the use of any crop-based feedstock.

#### Brazil biodiesel contract discounts widen

A surplus of biodiesel in Brazil has led producers to increase discounts against prices in contracts with fuel distributors for March delivery, according to an *Argus* analysis of the biofuel price formula used by plants. Many producers in the southern state of Rio Grande do Sul have offered a series of discounts in a bid to claw back market share from central-western Mato Grosso state. Discounts in Rio Grande do Sul ranged from 260-400 reals/m<sup>3</sup> for March, from R250-350/m<sup>3</sup> in January and February, according to an *Argus* survey. The discounts offered by plants in Mato Grosso ranged from R350-410/m<sup>3</sup> in March from R300-400/m<sup>3</sup> in January and February.

**Argentina biodiesel prices**

**\$/t**



#### South American biofuel price outlook

Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
<b>Brazilian ethanol</b>											<b>\$/m<sup>3</sup></b>
Anhydrous fob Santos	705	681	667	681	693	726	700	717	683	685	688
<b>Argentinian biodiesel</b>											<b>\$/t</b>
SME Argentina fob Upriver	1,514	1,500	1,506	1,371	1,374	1,379	1,375	1,442	1,535	1,594	1,541

## ASIA-PACIFIC

### Regulation

#### Palm oil export taxes rise

Malaysia has decided to hold its crude palm oil (CPO) export duty at the top rate of 8pc for the 28th consecutive month in March. The reference price fell from 3,893 ringgit/t (\$869/t) in February to 3,710 ringgit/t, but continued to exceed 3,450 ringgit/t — the level above which the maximum tax rate becomes applicable — as they have done since January 2021.

Indonesia increased export taxes and levies on palm oil products from 16-28 February after the CPO reference price for the same period rose above \$880/t, triggering the upper band of duties and levies. The CPO reference price rose from \$879/t for 1-15 February to \$880/t for 16-28 February, according to Indonesia's trade ministry. The reference price has continued to rise, reaching \$890/t for 1-15 March, but this has had no further effect on the taxes applied. CPO will now be subject to a \$74/t export duty, up from \$52/t during the previous period, while an export levy of \$95/t will apply on the same product, up from \$90/t previously.

#### Indonesia to restrict palm oil exports until May

Indonesia will introduce fresh curbs on vegetable oil exports to boost domestic cooking oil availability by 50pc ahead of the Eid al-Fitr holiday at the end of April. Producers and refiners will have to temporarily surrender two-thirds of their palm oil and used cooking oil (UCO) export quotas. The government will return these allowances in stages, starting from 1 May.

#### India officially launches E20

India officially launched the E20 gasoline grade at 84 retail filling stations across 11 states and union territories on 6 February, following pilot sales that started in late December. The country has an initial target of achieving nationwide E20 blending by 2025, but the government is confident that it will meet this goal before that date.

#### New Zealand scraps new biofuels mandate

The New Zealand government has cancelled the planned rollout of a biofuels mandate as part of a raft of policies aimed at tackling the rising cost of living. The mandate, which was originally due to come into effect on 1 April, would have introduced a 2.4pc emissions intensity reduction target by 2024 scaling up to 9pc by 2030, and had already been delayed by a year to 1 April 2024 to mitigate the impact of high fuel prices.

### Demand and prices

#### Biodiesel

##### EU Traces-NT system hinders trade activity

The European Commission introduced the Traces-New Technology (NT) certification for the importation of goods into the bloc earlier this year, requiring all upstream suppliers of kitchen waste, including UCO, to register with the platform by 31 January. The directive was issued on 1 December, but miscommunication between the commission and EU member state national authorities resulted in some cargoes of UCO from Asia-Pacific being denied entry at European ports in February. The programme has now been delayed, providing relief for both exporters and importers, but traders remain wary. Slowdowns in UCO exports to Europe during February weakened both used cooking oil methyl ester (Ucome) and UCO fob China prices, which fell by 3.9pc and 3.5pc on the month respectively, to \$1,297/t and \$1,037/t.

Liquidity returned to the Ucome markets in the Amsterdam-Rotterdam-Antwerp (ARA) region in the first week of March, lending some support to Asia-Pacific Ucome suppliers, and we expect market sentiment will continue to improve through the month. We forecast Ucome fob China prices to rise by 4.9pc from February, to average \$1,360/t in March. We expect prices to continue to rise through the next quarter, reaching \$1,540/t in June, bringing the average price in the second quarter to \$1,473/t, up by 10pc from January-March.

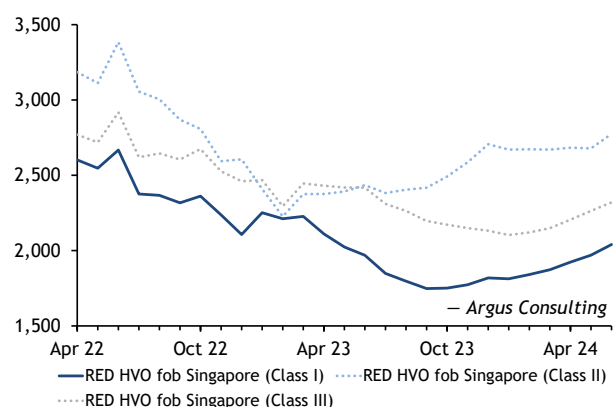
#### HVO & SAF

##### HVO Class I prices expected to weaken this year

Prices for hydrotreated vegetable oil (HVO) Class I, II and III fob Singapore all fell on the month in February, tracking price changes in their fob ARA counterparts, which came under pressure from weaker diesel prices.

HVO Class I prices rallied in January, but quickly corrected in February, falling by 1.8pc to \$2,212/t. As palm oil is no longer covered in the *Argus* assessment, HVO Class I liquidity has fallen, and with fob ARA prices forecast to weaken this year, we expect fob Singapore prices to move in a similar direction. We expect the price to weaken month on month through the following two quarters, falling to \$1,748/t in September and we predict this is where prices will settle, averaging close to \$1,780/t in the fourth quarter.

## Asia-Pacific HVO prices



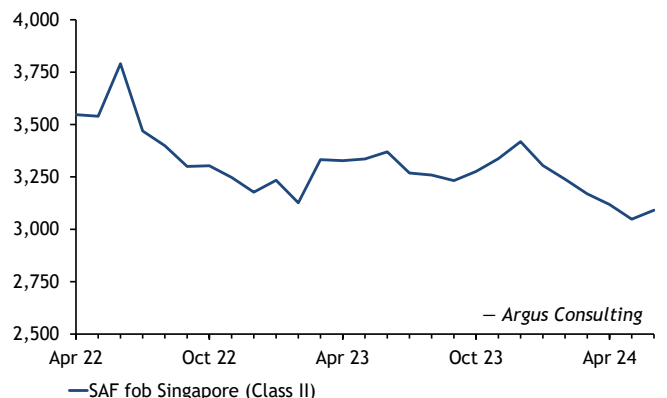
## HVO Class III maintains premium to Class II

HVO Class II and III prices in February fell by 7.6pc and 7pc on the month, to \$2,227/t and \$2,295/t, respectively, following trends in the ARA region and resulting in a second month where Class III is priced at a premium to Class II. This is an unusual pricing dynamic, caused by weak UCO demand from Europe and illiquid tallow markets. Based on expected price trends in the ARA region, we expect HVO Class II and III prices to rally in March, with both rising by just over 6.5pc to \$2,375/t and \$2,446/t, respectively. We expect the Class III premium to Class II to persist until June, and we forecast prices for Class III will weaken month on month throughout the second quarter. We forecast HVO Class II and III prices will be \$2,435/t and \$2,418/t in June, then average just above \$2,400/t and \$2,257/t, respectively, during the third quarter.

## Weak jet fuel complex weighs on SAF

Falling jet fuel prices bore down on SAF prices, which fell by 3.3pc to \$3,126/t in February, the lowest monthly average in 14 months. Premiums to the underlying gasoil contract also fell during the month, with the weaker jet fuel prices expected for the coming year likely to put pressure on any

## \$/t Asia-Pacific SAF prices

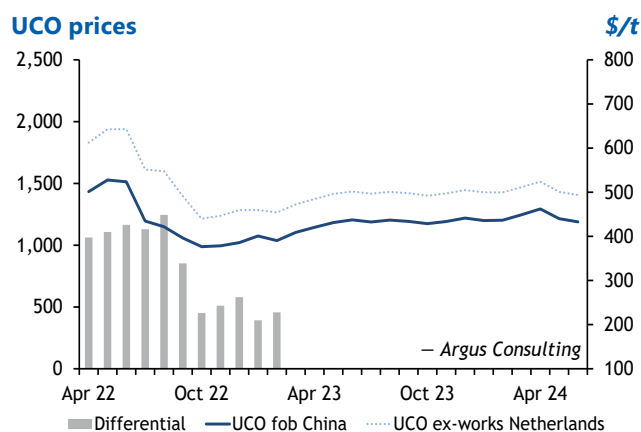


SAF price recovery. We expect SAF fob Singapore prices to average approximately \$3,344/t and \$3,253/t in the second and third quarters, respectively.

## Feedstocks

## China UCO prices fall on export uncertainty

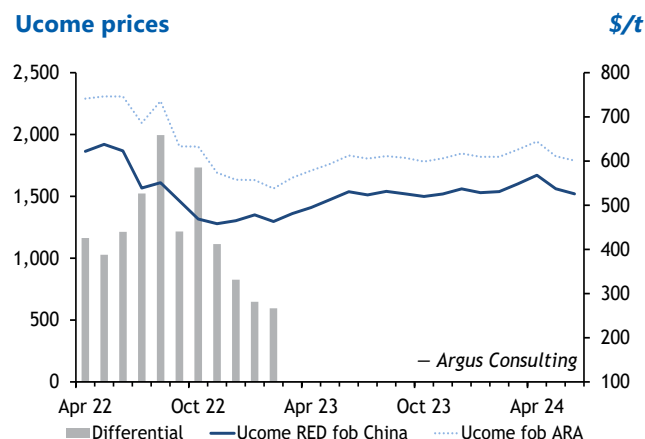
Trade confusion surrounding the EU NT certification scheme weighed on UCO fob China prices in February, but they did



## Asia-Pacific biofuel price outlook

Product	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	2Q23	3Q23	4Q23	1Q24	2Q24
<b>Biodiesel</b>											
Ucome RED China fob	1,350	1,297	1,361	1,410	1,473	1,538	1,473	1,524	1,526	1,557	1,585
<b>HVO</b>											
HVO Class I Singapore fob	2,251	2,212	2,227	2,111	2,024	1,969	2,035	1,798	1,781	1,842	1,978
HVO Class II Singapore fob	2,409	2,227	2,375	2,376	2,393	2,435	2,401	2,401	2,595	2,671	2,712
HVO Class III Singapore fob	2,468	2,295	2,446	2,431	2,419	2,418	2,423	2,257	2,151	2,125	2,263
<b>SAF</b>											
SAF Class II Singapore fob	3,234	3,126	3,333	3,328	3,335	3,370	3,344	3,253	3,344	3,237	3,086
<b>Feedstock</b>											
UCO China fob	1,075	1,037	1,103	1,145	1,183	1,204	1,177	1,194	1,195	1,216	1,232

## Ucome prices



not fall by as much as would be expected owing to concerns over palm oil and UCO exports from Indonesia. The stronger domestic market obligation and new B35 mandate had already tightened Indonesian feedstock availability, while further pressure was introduced as the government rescinded two-thirds of palm export licences to secure domestic cooking oil supply ahead of the Eid al-Fitr holiday. We expect UCO price offers to reflect this concern, with prices rising by around 6pc in March to \$1,103/t. Prices should remain well supported through the second quarter, and will average close to \$1,177/t.

## Trade

## UCO and Ucome

## Indonesia's biodiesel exports up, UCO down in 2022

Indonesia's overall biodiesel exports increased in 2022 compared with 2021, but the country's UCO sales declined on the year. Indonesia exported 436,000t biodiesel last year, more than doubling from 181,000t a year earlier. China was

the largest buyer, taking about 234,000t throughout the year. Indonesia is still looking to reduce its dependency on the European market as exports to the bloc are expected to fall further this year. Jakarta has mandated blending of 35pc biodiesel (B35) in road transport fuels from 1 February.

Indonesian UCO exports declined by 37pc to 218,000t in 2022 from 346,000t in 2021. Malaysia was the biggest buyer, taking around 72,200t, as UCO volumes tend to be exported to the country for consolidation before being shipped overseas. Spain was the second-largest buyer, importing 60,300t, with Singapore taking 35,000t.

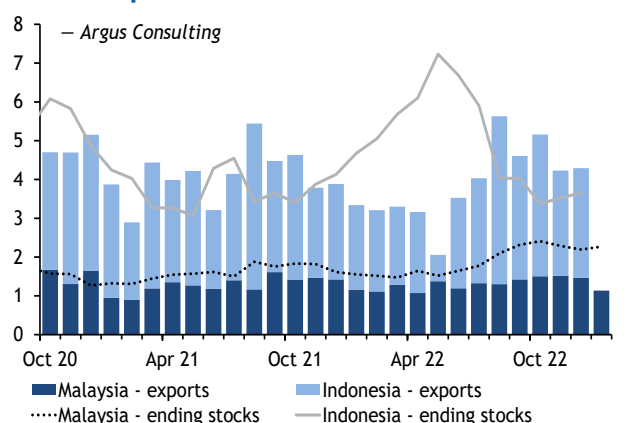
## Palm oil

## Malaysian palm oil stocks rise in January

Malaysian palm oil stocks in January rose for the first time in three months, as a fall in exports helped offset the impact of lower production, according to the latest data. Palm oil stocks in Malaysia, the world's second-largest producer, climbed to about 2.27mn t by the end of January, their highest since November last year, and 46pc higher than in January 2022, according to the Malaysian Palm Oil Board. The build in palm oil inventories was supported by a sharp decline in exports, which fell by 23pc on the month to 1.14mn t in January, as China's latest Covid-19 outbreak quashed demand ahead of the lunar new year holiday.

Malaysian CPO production fell by 15pc from December to 1.38mn t in January, the lowest in 11 months. The country's palm oil sector has grappled with persistent labour shortages and incessant flooding as a result of seasonal tropical monsoons exacerbated by a third year of La Nina, which weighed on production for a third consecutive month. Palm oil production typically falls after the August-November peak season, with February often representing the low point.

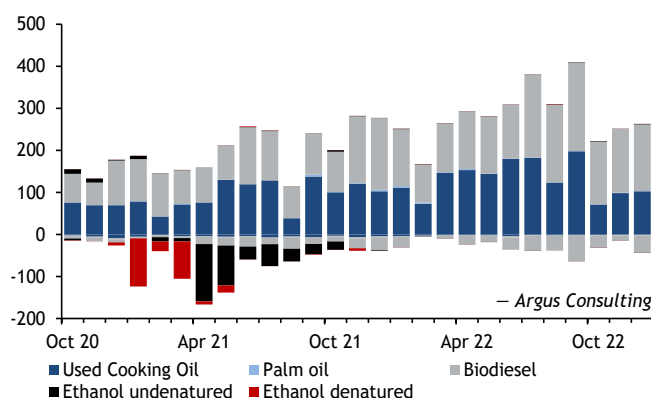
## Asia-Pacific palm oil trade



mn t

## China biofuels and feedstocks trade

'000t



**Indonesian demand expected to offset lower exports**

The Indonesian palm oil industry was marked by numerous events during 2022 that affected prices, output and consumption. Incessant heavy rain and flooding owing to a third year of La Nina and high fertilizer prices weighed on palm oil output. Meanwhile, exports were affected by a surge in prices in the vegetable oil complex as a result of the Russia-Ukraine conflict that began in February 2022 and drought conditions that undermined soybean oil production in South America. And Indonesia's government made numerous

changes to export regulations after deciding to implement a domestic market obligation at the end of January 2022.

CPO output was marginally lower in 2022 at 46.7mn t, falling by around 159,000t from a year earlier, Indonesian palm oil association Gapki said. But domestic consumption of palm oil products climbed to 21mn t from 18.4mn t, rising by 14pc over the year. Indonesia's palm oil consumption is expected to rise further in 2023 owing to the implementation of the B35 blending mandate on 1 February.

## GLOBAL SUPPLY

### Europe

UK renewable fuel supplier Olleco and US agricultural commodities firm Bunge plan to open a UCO collection and processing plant at Stolthaven Terminals, southeast England. The plant is expected to be operational in 2024.

Dutch fuel storage firm Vopak has agreed to buy a 1.1mn m<sup>3</sup> oil terminal site in Antwerp, Belgium, from trading company Gunvor, which it plans to adapt to store biofuels.

Logistics firm DB Schenker has signed an agreement with Switzerland-based Mediterranean Shipping (MSC) to use 12,000t of biofuels in the transportation of around 30,000 standard containers. The companies will be blending UCO at 20-30pc, to provide 50,000t of fuel for use by MSC's fleet.

Switzerland-based refiner Varo Energy has entered an initial agreement to start selling SAF to German airline Lufthansa by 2026, and to study the use of non-edible biogenic feedstocks to produce green hydrogen.

Finnish refiner Neste Oil has agreed to supply 36,000 t/yr of SAF to Hungary's Wizz Air for three years from 2025, across the airline's network of routes in Europe.

Denmark-based Arcadia e-Fuels has begun consulting on an e-SAF plant to be built in Vordingbor, Denmark. The plant is expected to come on line in 2026 and to produce around 80,000 t/yr of e-kerosene and e-naphtha, with the flexibility to produce e-diesel.

A new method of producing ethanol from aquatic biomass developed by the European Commission's LIFE Biomass C+ initiative has been found to meet EU standards, according to the European Climate Infrastructure and Environment Executive Agency. LIFE Biomass C+ produced ethanol using the starch-rich roots and rhizomes extracted from an aquatic plant called southern cattail, meaning it does not compete with food consumption, unlike conventional ethanol.

### North America

US refiner PBF Energy and Italian owned Eni Sustainable Mobility have signed a joint-venture agreement for a renewable diesel project at the same location as PBF's Chalmette refinery, east of New Orleans, in Louisiana. The project will target a processing capacity of 1.1mn t/yr of feedstocks, for a production capacity of 20,000 b/d.

Texas-based Darling Ingredients has entered an offtake agreement with Cattlemen's Heritage Beef to purchase beef cattle-based feedstocks from its facility in Iowa, which is expected to come on line in 2024. Darling has signalled its intentions to expand its rendering plant in nearby Bellevue, Nebraska, to handle the increase in supply. Darling Ingredients has also signed an agreement with Panda Restaurant Group to recycle UCO from Panda's more than 2,400 locations across the US.

US United Airlines and other industry players have invested \$100mn in a newly created fund that will prioritise investment in new technologies, advanced fuel sources and proven producers to scale up the supply of SAF.

Blue Blade Energy, a new venture between ethanol producer Green Plains, United Airlines and infrastructure firm Tallgrass, plans to build a new ethanol-based SAF pilot facility next year, followed by a full-scale facility that would begin commercial operations by 2028. United Airlines has entered an offtake agreement with Blue Blade Energy for up to 135mn USG/yr of SAF and up to 2.7bn USG in total.

US refiner Valero Energy and Darling Ingredients plan to add SAF production capacity to their 50:50 joint-venture Diamond Green Diesel plant in Port Arthur, Texas. The project is expected to divert up to 50pc, or 235mn USG/yr, of the plant's production capacity to SAF and will be operational by 2025.

US aircraft manufacturer Boeing will buy 1.7mn USG of SAF from Neste to power its US commercial operations this year. The SAF will be blended with conventional jet at a 30:70 ratio to produce 5.6mn USG of fuel.

US engineering company KBR has launched an SAF production technology with Stockholm-based biofuels research and engineering company Swedish Biofuels. In addition to processing ethanol, the new technology can convert CO<sub>2</sub> and synthesis gas into SAF.

Shell subsidiary Equilon and Colorado-based agricultural firm S&W Seed have set up a joint venture, Vision Bioenergy Oilseeds, to develop cover crops as feedstocks for biofuel production. The joint venture will look at developing camelina and other oilseeds that can be crushed for both oil and meal, and is expected to begin initial grain production in late 2023.



## South America

Local firm Pindorama started producing ethanol from corn at its sugarcane-based unit in Alagoas state in Brazil, becoming the first flex mill in the country's north and northeast. The firm expects to produce 130,000 litres/d (755 b/d) of ethanol.

## Asia-Pacific

TotalEnergies has delivered 2,000t of B24 marine biofuel for the first time to shipping company Hapag-Lloyd in Singapore, as part of a new term supply agreement.

Japanese firms Nippon Paper, Sumitomo and Green Earth Institute have signed an agreement to study bioethanol output

from wood chips to produce SAF, targeting production start-up in the financial year ending 31 March 2028. The ethanol output is expected to be in excess of 10mn litres/yr and will be supplied mainly to domestic SAF producers.

Paris-based Axens has signed an initial agreement with Indian biotech company Praj for the production of alcohol-to-jet SAF using low-carbon ethanol and isobutanol.

Indian refiner IOC and US company LanzaJet have agreed to pursue the production of SAF from alcohol in India. Plant capacity has yet to be announced, but the parties are working towards a joint venture to deploy the alcohol-to-jet process.

## Interested in CTO as a feedstock for HVO and SAF?



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Japan's Idemitsu has set a target to produce 100mn litres/yr of SAF through an alcohol-to-jet production process at its Chiba refinery in east Japan's Chiba prefecture, aiming to start supplies from 2026-27.

Japan Airlines (JAL) plans to procure around 400mn litres/yr (6,800 b/d) of SAF by the financial year ending 31 March 2031, equating to 10pc of JAL's annual jet procurement.

## Middle East & Africa

US firm Lanzatech and Abu Dhabi's Tadweer will explore opportunities to develop a large-scale conversion plant for transforming municipal solid waste (MSW) into sustainable alternative fuels, increasing the number of deals Tadweer has signed to explore producing SAF from hydrogen and MSW.

South African energy firm Sasol and Danish Topsoe have signed an initial agreement to establish a 50:50 joint venture that will develop, build, own and operate SAF ventures based on the firms' proprietary technologies.



Argus Biofuels Outlook is published by Argus Media group

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**ISSN: 2752-6976**

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