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JET FUEL INTELLIGENCE®

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UNITED KINGDOM

UK Aviation Recovery Faces Fresh Headwinds

Huge pent-up demand for air travel released after Covid-19 restrictions were lifted in the spring has fueled a near three-fold increase in UK jet fuel demand so far this year. Airline buying nudged 4.3 million metric tons (185,500 barrels per day) in the first six months of 2022, according to new data from the UK's Department for Business, Energy and Industrial Strategy (BEIS).

Jet demand in Europe's biggest aviation market was still 29.5% below pre-pandemic levels with acute airport staffing shortages stifling the recovery over the summer. Now economic recession is set to take a toll. The UK is already battling the highest inflation and lowest economic growth in the G7 with a weak pound driving fuel bills even higher. The UK's main Heathrow airport was forced to impose a 100,000 per day limit on passenger numbers in July following widespread cancellations and delays. The cap is set to remain in place at least until the end of October.

Parallel UK diesel demand was only 5% below pre-pandemic levels in the first half of this year despite sharply higher pump prices and a shortage of tanker drivers causing fuel shortages. Diesel buying actually went above 2019 levels in May — when the jet fuel deficit also narrowed to less than 16% — but has since begun to soften. Kerosene rather than diesel is used as a heating oil in more rural UK areas.

Balancing Act

UK jet fuel balances are still finding their equilibrium after a two-year hiatus. So far this year imports have met three-quarters of UK airline buying — similar to the share seen before the pandemic. Imports completely swamped the market in both 2020 and 2021 as global trade flows struggled to adjust to new Covid-19 realities. Imports rose 54% year on year but remain 29% below pre-pandemic levels.

The UK's own refiners initially produced too much jet, mainly as a by-product of other fuels, and then far too little as they focused on diesel ahead of a ban on mainstay Russian imports. UK jet output is up more than 200% on last year's dismal effort but remains 27% below 2019 levels. In contrast, UK diesel production is 5% higher than pre-pandemic rates and up 17% year on year.

Diesel imports also rose 9% year on year to 6 million tons or enough to meet just over half of UK buying. Efforts by the UK to wean itself off Russian ultra-low sulfur diesel (ULSD) have been successful. Russia made up two-fifths of UK diesel imports in 2019 but arrivals have fallen to zero since June, according to tanker trackers.

Instead, imports from the Mideast Gulf and Asia on much larger ships, including at least one newbuild very large crude carrier bringing ULSD from the United Arab Emirates, mean more ship-to-ship activity off Southwold. Key diesel import terminals

>> continued on page 2

UK JET FUEL BALANCE, '000 METRIC TONS

	Production	Imports	Deliveries
H1'22	1,715	3,226	4,261
H1'21	550	2,096	1,579
H1'20	1,361	2,427	2,914
H1'19	2,353	4,556	6,047
vs. '21	211.6%	53.9%	169.9%
vs. 19	-27.1%	-29.2%	-29.5%

Source: BEIS

on the Thames were only designed to handle the medium range tankers used to carry Russian fuel.

Pipeline Problems

UK jet fuel infrastructure is also under pressure. Work to replace a jet fuel pipeline supplying Heathrow airport was delayed after climate protestors occupied underground tunnels being prepared along the route.

Exxon Mobil's Southampton to London pipeline (SLP) project seeks to replace 90 kilometers of the 105 km jet fuel pipeline running from Exxon's Fawley refinery on the south coast to the West London Terminal storage facility. Exxon says the project will keep 100 fuel trucks a day off the road. But the project, which is still due to be completed early next year, has become a target for environmental groups. As well as renewing old pipes built in 1972, the new SLP will have higher capacity to serve expected growth in fuel demand at Heathrow.

All Change

Efforts to decarbonize UK aviation risk being derailed by new UK Prime Minister Liz Truss and her appointment of known climate skeptic Jacob Rees-Mogg as Secretary of State for BEIS. Rees-Mogg is responsible for overseeing the UK's efforts to achieve net-zero carbon emissions by 2050 but has already signaled plans to boost UK fossil fuel production, including lifting a ban on fracking. Green levies were also scrapped as part of a plan to bring down energy prices this winter.

Practical action to decarbonize UK aviation, including a blending mandate for sustainable aviation fuel (SAF) from 2025, remains under the remit of the Department of Transport. The UK has already committed to having five commercial-scale SAF plants under construction by then so that SAF can make up 10% of the UK's jet fuel mix or roughly 1.2 million tons per year by 2030.

Kerry Preston, London

MARKET FORCES

Russian Diesel Still Flows to Europe Ahead of EU Sanctions

Despite impending EU sanctions on Russian oil, Europe still depends on Russia for half of its lifeblood diesel imports. Russian exports of ultra-low sulfur diesel (ULSD) have continued flowing into Europe but are set to fall in September when many Russian refineries go into planned maintenance. Sources say diesel sailings could drop to less than 400,000 barrels per day in September from more than 500,000 b/d in August.

EU imports of diesel and gasoil from Russia's Baltic and Black Sea ports have averaged between 520,000 b/d and 600,000 b/d in recent months, on par with pre-war imports. That's partly due to steep discounts, with Russian ULSD trading anywhere from $50-$100 per ton below other origins in Northwest Europe. Just two dedicated jet fuel cargoes left Russia from Baltic ports, one for the Netherlands sold by Rosneft and one for Turkey sold by Novatek.

EU countries keep loading up on these volumes while they can, as they scramble to line up alternative sources ahead of an EU ban on Russian refined product imports that takes effect on Feb. 5, 2023. Europe's diesel imports from India, the UAE and India are up sharply through May, according to data from the International Energy Agency. The UK has already replaced all of its Russian diesel imports with supplies from the Mideast Gulf and Asia.

Russia's integrated oil companies are keeping full product exports of 2 million b/d going as they maintain high utilization rates to absorb domestic crude supplies. Moscow's state coffers depend on crude oil production taxes to balance the budget. Refined products are its second largest source of foreign exchange income after crude exports, bringing in more revenue than natural gas. Refinery runs had recovered to 5.6 million b/d in July and August after dropping to 5.1 million b/d since Russia's invasion of Ukraine in late February. Pre-war runs averaged 5.8 million b/d.

Shift in Destinations

Once the ban takes effect, Europe would become much more dependent on diesel imports from the US and the Mideast. But some Russian diesel could still flow to the EU if it is commingled with diesel from other sources, traders point out.

Already Russia is sending more diesel to the Mideast. The United Arab Emirates, Oman and Yemen are new destinations for diesel sales. Russian diesel has also made its way from Black Sea ports to non-traditional markets in Ecuador, Egypt, Senegal and Tunisia. More exports are likely to flow to Latin America, especially to Brazil, which would free up US diesel that now goes to Latin America to move across the Atlantic.

Trade War

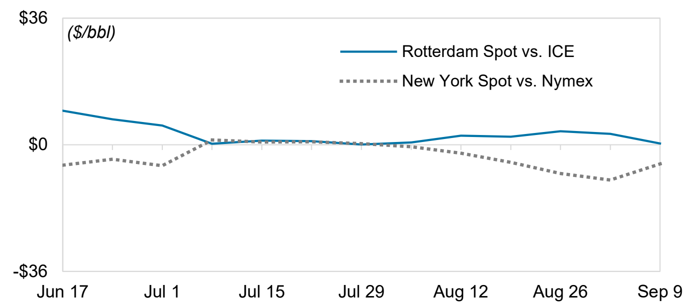
EU import embargoes start with crude oil on Dec. 5 and affect the remaining 2.2 million b/d of Russian crude and products that still flow to the EU. That takes into account exemptions from sanctions for some countries, including Hungary, Slovakia, the Czech Republic, Bulgaria and Croatia. A second ban would prohibit ships from handling Russian oil if they have any connection to EU insurance companies or banks. It is more problematic for oil markets since it impacts all of Russia's 5.7 million b/d of global seaborne exports to any destination.

To keep the oil flowing but reduce Moscow's oil revenue, finance ministers from the G7 group want to put a price cap below market value on Russian oil exports. It would effectively waive the shipping ban by allowing buyers who comply with the price cap mechanism to use Western tankers. Ship brokers say the world does not have enough tankers outside the Western system to keep all of Russia's oil flowing. They say there might be enough vessels to support much of its crude oil exports, but not its refined products.

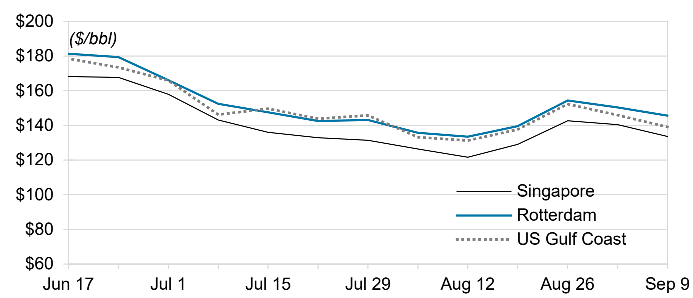
Russia has vowed to boycott the plan and even threatened to limit exports. "Russia has essentially declared war on Europe and will turn off the flow of energy," one analyst said, adding that what has already been happening in the natural gas market will likely play out in the oil market too.

John van Schaik, New York

JET-GASOIL SPREADS



SPOT JET FUEL PRICES



EUROPEAN QUARTERLY JET FUEL SWAPS QUOTES

(Bid/Offer Range in $/ton, c.i.f. NWE)

Q	Chg.	Sep 9	Sep 2
Q4'22	10.25	1,063.00 - 1,064.00	1,052.75 - 1,053.75
Q1'23	3.75	991.50 - 992.50	987.75 - 988.75
Q2'23	-7.00	941.50 - 942.50	948.50 - 949.50
Q3'23	-9.00	916.00 - 917.00	925.00 - 926.00

Prices are live for midday. Source: FCStone

SPOT CARGO MARKETS

Markets Crumble on Demand Destruction Fears

Oil prices have fallen to their lowest level since before Russia's invasion of Ukraine as fears of demand destruction took a heavy toll. Benchmark Brent fell below $90 per barrel for the first time since February. Losses of more than $3/bbl on the week sent alarm bells ringing at Opec-plus with the alliance reasserting its intent to be "attentive, pre-emptive and proactive" in supporting market stability. But price volatility may be out of its control. G7 countries have engaged in a power play with Russia over its 5.7 million barrels per day of crude and refined product exports. A deep economic recession is looming in Europe with the impact already being seen on energy consumption. Chinese demand is also weak with Beijing's zero-Covid-19 policy forcing around 25% of China's economy into lockdown.

International benchmark Brent fell $3.21/bbl or 3.5% on ICE to finish the week at $89.15/bbl Thursday while low-sulfur gas oil futures on the same exchange rose 2.3% to $1,075 per metric ton. WTI fell $3.07/bbl to $83.54/bbl on Nymex. G7 countries want to keep Russian oil flowing while reducing the amount of money going to Moscow to fund Putin's illegal war. The market has warned that capping oil or gas prices is wishful thinking. Moscow has already threatened to cut off anyone supporting the price cap with supply shortages set to boost oil prices by up to $20/bbl. Cynics say the EU will end up buying re-routed Russian crude from other sellers to fill the gap.

European jet fuel cargo differentials collapsed as a wall of September imports began to arrive too late for the peak summer season. A hefty 1.7 million metric tons of fuel is set to arrive from the Mideast Gulf and Asia this month, the highest monthly total seen since before the pandemic. The figure includes multiple very long-haul shipments from South Korea loaded back in July. They are set to arrive just as airlines are switching to lighter winter flight schedules and facing the prospect of much lower passenger demand. Northwest European cargoes were pegged at just a $13.75 per ton premium over front-month ICE LSGO futures at Thursday's close, down sharply from $52.25/ton at the end of last week. Firmer gasoil futures meant flat jet fuel prices fell far less than crude despite the dramatic move in differentials. Europe's gasoil market is set to become more detached from crude as the region scrambles to replace banned Russian diesel imports from February next year.

Latest jet fuel arrivals in Amsterdam-Rotterdam-Antwerp included the LR2s *STI Puma* bringing fuel from the United Arab Emirates and *Pacific Anna* carrying fuel from Kuwait and Bahrain, and the LR1 *Ust Luga* with soon-to-be banned Russian jet onboard. Jet tanks in ARA recovered from their recent two-and-a-half year low as a result, reaching 771,000 tons on Sep. 8, according to Insights Global. ARA jet tanks are still down 25% on last year but 8% higher than this time in 2019. Jet tankers from India and Kuwait also arrived in the UK this week and from South Korea into northern France. Russian jet has mainly headed to Turkey since major oil companies and airlines began self-sanctioning after Moscow's invasion of Ukraine with only occasional tankers going into ARA tanks most likely for re-export.

US jet fuel markets stabilized following their steep slide last week as Nymex diesel futures found a floor at $3.54 per gallon. Jet spreads narrowed on the Gulf and West Coasts to offset some of that loss, putting average jet prices at $3.33/gallon. Day-to-day volatility in August has given way to more stable cash values in the $3.31-$3.46 per gallon range. Re-opening of BP's 440,000 b/d Whiting refinery in Indiana after a fire will replenish supplies in the Midwest, with Chicago differentials sinking to 13¢/gallon below October diesel futures from a 1¢ discount last week. With oil prices falling faster than products, crack spreads have recovered back to $63 for diesel and $55/bbl for jet fuel.

Airlines were still drawing down stocks from the surge in jet fuel deliveries around Labor Day that drove demand back to 2019 levels. Sales plunged by 400,000 b/d in the week ended Sep. 2 to 1.43 million b/d, their lowest level since early July. Lower air traffic flows heading into the fall travel season should put a damper on jet sales in coming weeks. Production dropped by 72,000 b/d to 1.57 million b/d – the first slide below 1.6 million b/d since early April. Imports also took a nosedive to 24,000 b/d or just one-quarter of their August volume.

Asian jet markets continued to defy the losses in Europe and the US despite weaker prompt demand. Singapore differentials jumped to a premium of $3.66/bbl to Singapore quotes before receding to $2.65/bbl on Sep. 8 for a 21¢/bbl gain from last week. A total of 310,000 bbl of jet loading by early October changed hands in the Platts window. Saudi Aramco sold 210,000 bbl on Sep. 6 at a $1.80/bbl premium to Singapore quotes to PetroChina. Aramco went on to sell another 100,000 bbl at a $1.70/bbl premium to Vitol on Sep. 8. Prompt jet demand came under pressure from a major decline in China's air traffic. Scheduled airline capacity in Northeast Asia dropped 10% from the previous week amid new lockdowns that spurred a 14% dive in China, according to data analysis firm OAG.

Kerry Preston, London, Cristina Haus, New York, Freddie Yap, Singapore

IN BRIEF

Straighter Flights Could Cut Europe's Carbon Emissions

Airlines could save up to 1,400 metric tons of jet fuel and 4,400 tons of CO_2 per day just by flying straighter routes in Europe, according to new analysis by Eurocontrol. The network manager has been investigating what impact a common unit rate for en-route air navigation charges would have. Current unit rates vary between €28.72 ($28.63) over Cyprus and €120.30 ($119.94) over Belgium and Luxembourg, encouraging airlines to fly cheaper but less environmentally friendly routes.

Eurocontrol found that on the peak day for air traffic last year — Aug. 27, 2021 — some 13,400 flights or 55% of the total did not take the most efficient route. If they had, the network manager suggests they would have saved 1,400 tons of jet fuel and avoided 4,400 tons of carbon — cutting CO_2 emissions by 1.6%. Eurocontrol has already suggested a reattribution mechanism to redistribute revenues between states if a common unit rate is adopted. The analysis also looked at how individual carriers would be affected. Ryanair would see its route charges fall by €70.3 million/yr while Emirates would see its annual bill rise by €32.3 million.

Alder Signs Deal for Biomass Feedstock

Alder Fuels has signed a long-term deal with Enviva that secures woody biomass feedstock for its first production facility that will be built in the southeastern US. Enviva becomes the exclusive supplier of 750,000 tons/year of sustainably sourced forestry byproducts such as treetops and limbs and commercial thinnings. Supply of feedstock for Alder's Greencrude (AGC) plant would begin in 2024. Conventional refineries can process the AGC from Enviva's feedstock into about 37 million gallons per year of carbon-negative sustainable aviation fuels (SAF). United Airlines has invested in Alder and has a commitment to purchase 1.5 billion gallons of its SAF.

Enviva is the world's largest producer of industrial wood pellets, with the capacity to make 6.4 million tons annually at ten plants in the southeastern US. It sells most of its output under take-or-pay contracts with customers in the UK, Europe and Japan. The feedstock supplied to Alder meets the requirements of the US federal Renewable Fuels Standard and the EU's Renewable Energy Directive as well as Enviva's policy for responsible sourcing. Introduced in 2019, that standard provides a guarantee for stewardship of forests from sourcing of tracts to verification and reporting through to conservation leadership.

THE METHODOLOGY BEHIND JFI'S PRICE PAGE

The Jet Fuel Intelligence data track prices and trends in spot cargo and futures markets as well as key biofuel prices, providing a concise summary of weekly trends. Spot cargo and futures prices represent weekly averages, and last week quotes are subject to revisions since JFI goes to press before final Friday prices are available. Assessments for regional prices are based on the common cargo size for that particular area. Quotes reported for the New York Mercantile Exchange and the Intercontinental Exchange (ICE) contract reflect the weekly average for the front-month contracts. Cargo prices are provided by Thomson Reuters as well as OPIS.

In the Key Biofuel Prices table, prices are listed for some of the main ethanol and biodiesel markets in the US and Europe. In the US there are prices for two futures contracts, the front-month CME CBOT ethanol contract and the front-month Nymex RBOB contract, as the equivalent gasoline contract. There are also prompt-month prices for ethanol in three spot markets: the Midcontinent hub, New York Harbor and the US Gulf Coast.

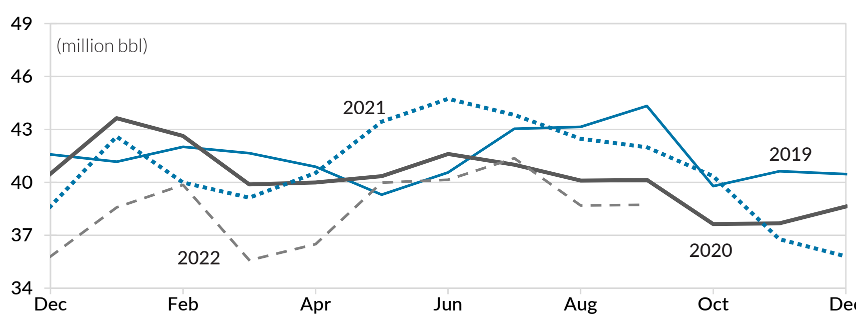
In Europe we list benchmark gasoil futures prices on the ICE in addition to prompt barge prices on a dollar-per-metric-ton basis f.o.b. in the Amsterdam-Rotterdam-Antwerp (ARA) market for unleaded premium gasoline and ultra-low-sulfur diesel (ULSD) as fuel reference prices alongside a range of biodiesel prices, all provided by Thomson Reuters.

Biodiesel prices are all quoted on a dollar-per-ton basis. Fatty Acid Methyl Ester (FAME) matches European fuel standards for summer grade with a cold filter plugging point (CFPP) of 0°C, and winter grade with a CFPP of -10°C on an f.o.b. ARA basis. Prices are also quoted for the main forms of feedstock biodiesel used in blending in Europe: SME produced from imported soya oil has a CFPP of around 0°/-5°C and is quoted on a c.i.f. ARA basis; PME produced from imported palm oil has a CFPP of +11°/+15°C and is quoted on a c.i.f. ARA basis; while RME produced from rapeseed has a CFPP of -10°/-12°C and is quoted on an f.o.b. ARA basis by Reuters on the basis of prices published by brokerage Kingsman SA.

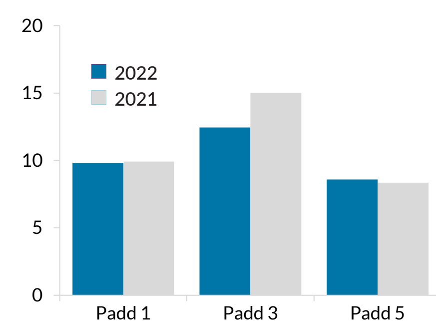
The JFI data table also charts mid-distillate crack spreads for Nymex heating oil versus ICE gasoil on a weekly and monthly basis, as well as global carbon and carbon futures prices from the ICE. EUAs are the credits used in the EU Emissions Trading System. Each is equivalent to one metric ton of carbon dioxide (CO_2) and are used by power generators and large industrial plants to cover their emissions. EUAs can be bought in the market, are auctioned by government, with some given away free.

US SUPPLY, DEMAND AND STOCK TRENDS AT A GLANCE

US JET KEROSENE STOCKS



REGIONAL STOCK LEVELS, SEP 2



JET KEROSENE STOCKS	2022					2021		Latest Levels vs.	
(million bbl)	Sep 2	Aug 26	Aug 19	Jul p	May p	Sep 3	Jul	Aug 26 '22	Sep 3 '21
East Coast (Padd 1)	9.8	10.1	9.3	12.8	10.2	9.9	11.1	-2.5%	-0.9%
West Coast (Padd 5)	8.6	9.1	9.4	11.2	10.2	8.4	7.9	-5.7	+2.7
Central (Padd 2-4)	20.3	19.4	21.0	22.0	19.5	23.5	24.8	+4.8	-13.5
Total Stocks	**38.7**	**38.6**	**39.7**	**46.0**	**40.0**	**41.8**	**43.8**	**+0.4%**	**-7.3%**

	2022				2021		Latest Wkly.	Aug '22 vs.	Jul '22 vs.
('000 b/d)	Sep 2	4 Wk. Avg.	Aug p	Jul p	Aug	Jul	Change	Aug '21	Jul '21
Jet Refinery Output	1,577	1,651	1,674	1,689	1,435	1,423	-4.4%	+16.6%	+18.6%
% Jet Yield	9.7	9.9	10.0	10.1	7.7	7.6	-2.5	+29.7	+33.8
% Utilization	90.9	92.7	93.1	93.1	90.4	90.9	-1.9	+3.0	+2.4
Imports	24	80	84	110	224	139	-88.4	-62.7	-20.8
Sales	1,432	1,616	1,654	1,577	1,563	1,501	-21.5%	+5.8%	+5.1%

p=Preliminary. *Source: US Department of Energy. Data has not been updated due to delays at the Dept. of Energy.*

JET FUEL INTELLIGENCE DATA

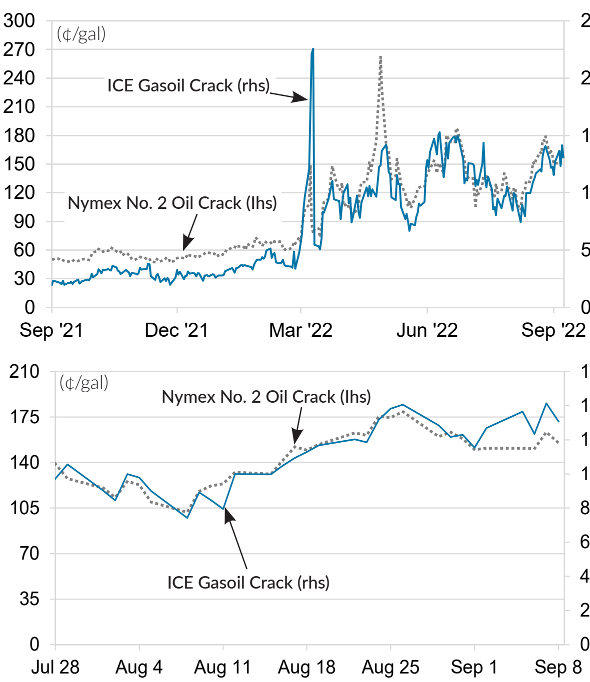
PRICES IN SPOT CARGO AND FUTURES MARKETS

	ICE Prompt Futures ($/ton)	European Spot Jet Fuel ($/ton)*		Asian Spot Jet Fuel Markets ($/bbl)†		
	Gasoil 0.1% Sulfur	NW Europe	Mediterranean	Mideast	Singapore	Japan c.i.f.
Weekly Trend	-10.76	-33.50	-52.88	-7.99	-5.17	-7.70
This Week	1098.94	1,150.00	1,117.34	130.52	133.69	138.35
Previous Week r	1109.70	1,183.50	1,170.23	138.52	138.86	146.04
Aug 22-Aug 26	1150.30	1,227.95	1,179.66	141.99	143.56	148.71
Aug 15-Aug 19	1048.60	1,113.55	1,076.35	128.83	129.82	135.03

	Nymex Prompt Futures ($/gal)	US Spot Jet Fuel Markets (¢/gal)			
	NY Harbor ULSD	New York†	US Gulf†	Chicago*	Los Angeles†
Weekly Trend	-0.15	-6.23	-13.61	-20.08	-9.44
This Week	3.57	343.66	331.08	349.68	345.66
Previous Week r	3.72	349.89	344.69	369.76	355.11
Aug 22-Aug 26	3.92	370.80	364.70	359.38	369.90
Aug 15-Aug 19	3.58	344.74	330.09	340.51	341.54

r=Revised. Source: *OPIS Worldwide Jet Fuel Report, †Refinitiv .

DISTILLATE CRACK SPREADS – ICE vs Nymex



KEY BIOFUEL PRICES

US ($/gallon)	Sep 2	Aug 26	Chg.
Futures			
CBOT Ethanol	2.51	2.56	-0.05
RBOB Gasoline	2.61	2.86	-0.25
Spot market			
Ethanol Midcont.	1.56	1.56	0.00
Ethanol NY Harbor	1.63	1.63	0.00
Ethanol US Gulf	1.63	1.63	0.00

Europe ($/ton)	Sep 2	Aug 26	Chg.
Futures			
ICE Gasoil	1,109.70	1,150.30	-40.60
Spot market			
Gasoline	882.90	952.30	-69.40
Diesel	1,122.60	1,159.10	-36.50

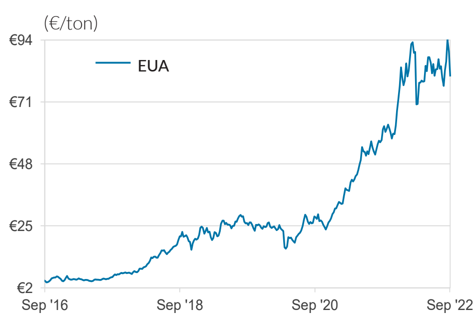
Source: Refinitiv, Exchanges

GLOBAL CARBON PRICES

(€/ton)	Sep 6	Aug 30	Chg.
EUA Dec '22	69.88	80.81	-10.93
US ($/ton)			
CCA (Calif.) Dec '22	27.70	27.37	+0.33
RGGI (NE) Dec '22*	13.49	13.55	-0.06
New Zealand (NZ$/ton)			
NZU (spot)	85.50	86.80	-1.30
Asia ($/ton)	**Sep 2**	**Aug 29**	**Chg.**
China (National)	8.41	8.47	-0.06
South Korea	20.20	20.29	-0.08

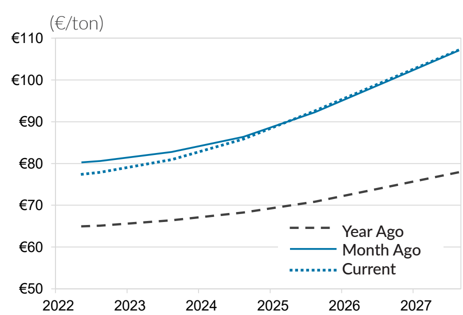
Benchmark months. *Short tons; all others metric tons.Based on given week's exchange rates. Source: ICE, OMF

EU CARBON FUTURES PRICES



ECX front-month futures. Source: ICE

EU CARBON FORWARD CURVE



ECX EUA forward curve. Source: ICE

DATA: JFI's biofuel and carbon data are sourced from EI New Energy, Energy Intelligence's publication on renewables, carbon and transportation. For more data and information, see www.energyintel.com/newenergy.