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# Mid-year commodity markets outlook

**Global commodities:** What began as a severely supply-constrained commodities market at the start of 2022, and turbo-charged by the war in Ukraine, is fanning the flames of global inflation. While there are many factors behind today's high inflation environment, including post-COVID stimulus and supply chain disruptions, underlying it all has been the near-decade of ESG-induced structural underinvestment in the ability to supply carbon to the world. As we stand at the half way mark of 2022, the inherent capex constrained problems miring commodities remain unresolved. Until the green transition is driven by clear, coherent and coordinated policy, we view the scarcity in carbon – powering the real economy as it appears in energy to food – as the best hedge against today's markets storm.

**Energy:** Oil is bouncing back as supply scarcity fears outweighs recessionary fears. We're running on extremely thin spare capacity – both crude and oil products. OPEC+ is mulling firing its last oil production bullets, whilst refining capacity for oil products which drives the real economy, has declined. Meanwhile, European gas markets remain on edge with Russian gas supplies falling fast with G7 nations failing to cap Russian gas (and oil) prices given the complexities in implementation.

**Base metals:** Base metals have recorded their worst quarter since 2008 with copper – bellwether for the global economy – ricocheting into a bear market. Beyond copper, the mood music is sombre in aluminium, zinc and nickel amid macro headwinds.

**Precious metals:** Gold and silver remains range-bound, between rising recession fears and a robust USD. PGMs are easing on recession angst but look undervalued.

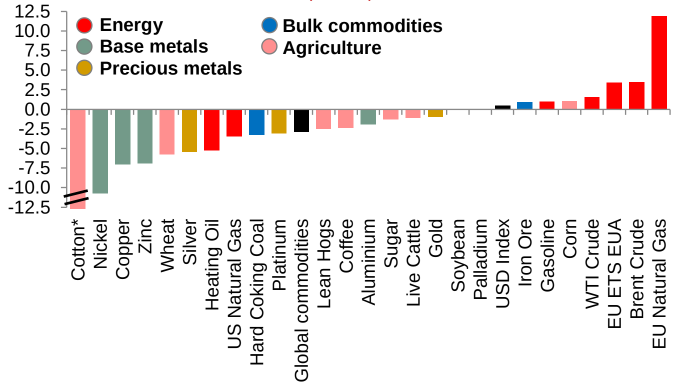
**Bulk commodities:** The "back-to-black" trade continues with coal prices well-supportive as European countries position for delicate gas-to-coal switching. Iron ore has not been immune from global macro concerns with fundamentals equally tepid.

**Agriculture:** We are turning bearish-to-neutral on the grains complex – wheat, corn and soybean – following a benign start to the Northern hemisphere planting season.

**Core indicators:** Price performance and forecasts, flows, market positioning, timespreads, futures, inventories, storage and products performance covered below.

ABSENT A DEEP RECESSION, CASE FOR COMMODITIES REMAINS COMPELLING

BLOOMBERG COMMODITY INDEX (BCOM) RETURNS, WEEK-ON-WEEK TO 29 JUNE 2022 (%)




Recession concerns have overtaken compelling commodity fundamentals for now but critically economic activity is only slowing – not falling. So long as demand levels are still above supply levels – substantiated by timespreads, physical premia and crack spreads all holding up despite easing spot prices – then the bullish case for commodities still holds, as demand growth can slow yet demand levels can continue to rise.

*Source: Bloomberg, MUFG Research; Cotton -26.8% w/w*

## GLOBAL COMMODITIES (-2.9% W/W; 19.5% YTD)

The incessantly runaway commodity (+19%) outperformance year-to-date while all major risk assets are entering bear market territory, is fanning the flames of global inflation

What began as a severely supply-constrained commodities market at the start of 2022, is being turbo-charged by the war in Ukraine. This is now the largest commodities supply shock since the 1973 oil embargo. However, unlike the 1970s, which was restricted to oil and was a sellers-boycott, the current crisis involves every commodity and is a buyers-boycott – and by delineation more permanent. This is now an extreme molecules crisis with shortages across energy, metals and agriculture – corroborated with 16 out of 23 futures contracts in the Bloomberg Commodities (BCOM) index currently trading in backwardation. The incessantly runaway commodity (+19%) outperformance year-to-date while all major risk assets are entering bear market territory, is fanning the flames of global inflation.

The structural underinvestments miring the commodities complex which pre-dates both the war and COVID remains unresolved with the scarcity in carbon signalling higher commodity prices ahead

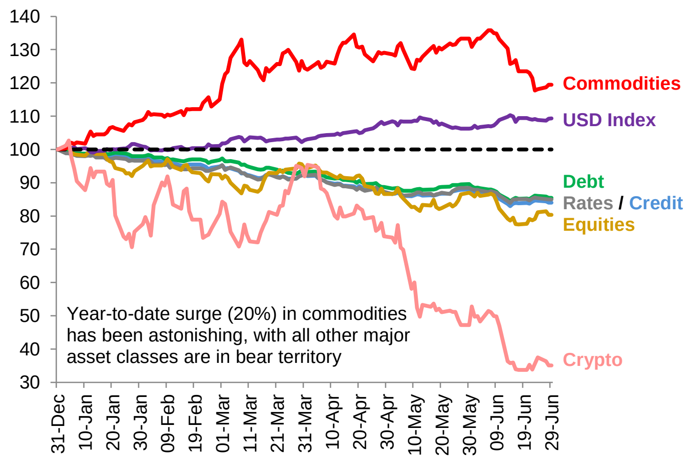
While there are many factors behind today's high inflation environment, including post-COVID stimulus and supply chain disruptions, underlying it all has been the near-decade of ESG-induced structural underinvestment in the ability to supply carbon to the world. With central banks laser focus on easing the burden of high inflation, there is a risk that the long-run cost of too deep of a recession is the end of the capex cycle and a failure to grow adequate capacity to debottleneck the system. This carbon-related scarcity is bringing into focus macro imbalances – from rising global interest rates to trepidations over the energy transition and the rising cost of living. As we stand at the half way mark of 2022, the inherent capex constrained problems that have been miring commodities which pre-date both the war in Ukraine and COVID – centred on ESG considerations whereby investors are rightfully apprehensive over the true cost to society of their investments – remain unresolved. Until the green transition is driven by clear, coherent and globally coordinated policy, we view the scarcity in carbon – powering the real economy as it appears in energy to food – as the best hedge against today's global markets storm.

Absent a deep recession, commodity price rises should continue as the "level" of demand will rise (in stagflationary environments) despite the "growth" of demand slowing

With recessionary calls growing ever louder, commodities have in recent weeks experienced a marked correction. Yet with no clear fundamental catalyst to trigger such a sell-off, we view it has been driven by recessionary concerns which continues to gain traction as real activity begins to slow and central banks pivot towards more aggressive hikes. Granted, in recessionary environments, commodity demand falls dragging down commodity prices with them. Though, economic activity is only slowing – not falling. This distinction matters as commodities are spot physical assets driven by demand "levels" while financial assets (equities, bonds and credit) are

### RUNAWAY COMMODITY PERFORMANCE YEAR-TO-DATE WITH FURTHER UPSIDE RISKS ON SCARCITY PRICING

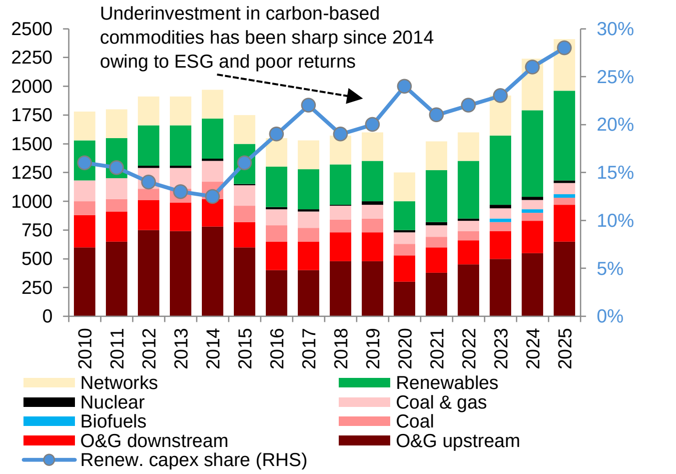
CROSS-ASSET PERFORMANCE YEAR-TO-DATE (100 = 1 JANUARY 2022)




Source: Bloomberg, MUFG Research

### CARBON-INTENSIVE CAPEX FELL 35% BETWEEN 2010-20 BUT WE EXPECT IT TO GROW 60% BY 2025

ENERGY CAPEX BY FUEL SUPPLY SOURCE (USD BN; % OF TOTAL)




Source: Bloomberg, MUFG Research;

driven by “growth” rates. As such, so long as demand levels are still above supply levels – substantiated by timespreads, physical premia and crack spreads all holding up despite easing spot prices – then the bullish case for commodities still holds, as demand growth can slow yet demand levels can continue to rise (see here).

Global central banks cannot control volumetric commodity markets driven by “levels” not “growth” rates

Interest rates-induced slowdowns are a short-term abatement of the symptom – inflation – and not a cure of the problem – structural underinvestment. When macro imbalances are physical and supply-driven, financial-based macro policies surrounding demand cannot resolve them, only coordinated investment policy can. While it appears that much higher rates are needed today to lower demand and inflation, they may also drive a fall in capex and investment that will prolong the structural under-capacity in physical commodities and hence this environment of high headline inflation and lower growth for years to come.

Government’s demand creation delays the market demand destruction needed

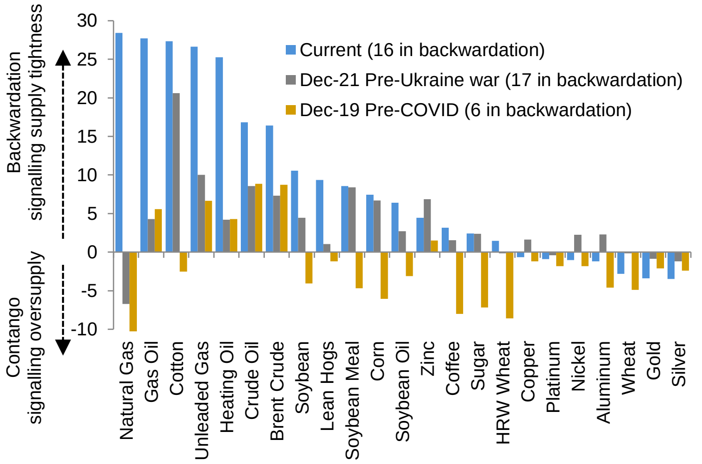
Beyond rate hikes, current macro policies are worsening – not resolving – elevated commodity inflationary pressures, in our view. Both US and EU policymakers have now cut gasoline taxes in an attempt to soften the price impact on consumers, yet such policies only delays the necessary demand destruction required to balance markets to ultimately allow price pressures to soften near-term. Also, windfall taxes – whilst politically appeasing in a period of falling real incomes – will only disincentivise the capacity expansion required to resolve the supply tightness. These fiscal policies are forcing monetary policy to once again do the work to rebalance the global economy, just as it did after the 2008-09 Great Financial Crisis (GFC). Yet, monetary policy by design cannot solve physical imbalances in the long run, leaving the economy persistently fluctuating between periods of slowing demand and cooling prices, and growing demand and higher inflation. Such fiscal policies reinforce the redistributive aspects of why oil remains in a long-term supercycle, as once inflation is generated, there are motivations for policymakers to protect the social-needs of lower-income households (that drive volumetric commodity markets) from rising prices which makes it more difficult to tame inflation.

Case for being long commodities remains compelling

On net, while recessionary apprehensions have overtaken fundamentals, the strategic case for being long commodities has seldom been this strong. From oil and gas presenting a hedge against risks to winding down hydrocarbon capacity, to key green metals like copper and aluminium hedging cost inflation risk for battery materials, to corn and soybean oil hedging risks from growing global biofuel demand, we are convicted that holding commodities throughout the green transition is central to stabilising returns and managing risks on the path to net zero.

## A MOLECULE’S CRISIS WHICH PRE-DATES THE WAR WITH SHORTAGES IN 16 OF 23 MAJOR COMMODITIES

12 MONTH TIMESPREADS OF EACH 23 BCOM INDICES (%)




*Source: Bloomberg, MUFG Research*

## HISTORICAL EPISODES OF HIGHER COMMODITIES, HIGHER RATES, INVERTED YIELDS AND GEOPOLITICS

| Date | Commodity price hike | Fed Fund rate hike | Geopolitics | Inverted yield curve prior to recession | Time to recession |
|---|---|---|---|---|---|
| 1973-74 | +148% | +643bp | Oil embargo | March 1973 | 7 months |
| 1979-81 | +84% | +930bp | Iran-Iraq war | September 1980 | 9 months |
| 1999-00 | +42% | +186bp | 9/11 attacks | February 2000 | 12 months |
| 2005-07 | +27% | +305bp | Financial crisis | June 2006 | 17 months |
| 2020-22* | +51% | Initiated | Russian sanctions | March 2022 | ? |

*Source: Bloomberg, MUFG Research; * up to 29 June 2022*

## ENERGY (-0.7% W/W; 62.3% YTD)

### Crude oil

Oil has rebounded with emphasis back on supply scarcity over recession angst

The oil market is bouncing back as supply scarcity fears outweighs recessionary fears. Globally, we're running on extremely thin spare capacity – both crude and oil products. OPEC+ is mulling firing its last crude production bullets as it runs out of capacity to pump more, whilst refining capacity for oil products (such as diesel, gasoline and jet fuel) which drives the real economy, has declined markedly. Given the severe tightness miring the complex, we reiterate our call that the price-induced demand destruction necessary to reduce consumption is set to become widespread by the third quarter, with a corresponding Brent price above USD140/b (see here).

G7 leaders are warming to the idea of price caps on Russian oil (and gas)

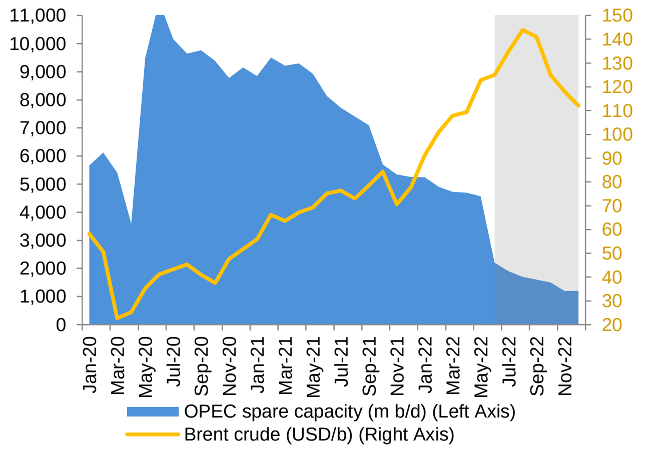
This week saw G7 nations promoting the idea of price caps on Russian oil (and gas) to both dent Russia's finance and ease energy inflationary pressures. Not only would it require the EU to renegotiate its latest iteration of sanctions, with some member countries likely reluctant to do so given prolonged duration that it took to formalise the plans to ban Russian oil, there are no guarantees that Russia would agree to ship its crude oil at capped prices – particularly if the cap is close to production costs. An additional dynamic is that Russia has begun carving out an alternative to the London-based Protection and Indemnity Club (P&I) clubs, by offering insurance through the Russian National Reinsurance Company, which may be suffice for certain Asian purchases that are now providing the bulk of the market for Russian crude oil. On net, whilst it would appear the willingness to impose a price cap on Russian oil remains resolute across the G7, the viability of such an imposition remains complex.

Scope of Russian crude oil decoupling and scale of global oil demand growth are key uncertainties for H2 2022

Among a confluence of uncertainties in global oil markets, the two biggest unknowns are the outlook for (i) Russian crude supply and for (ii) global demand growth. First, Russian supply fell from over 11m b/d in March to 10m b/d in April following its invasion of Ukraine, but it has recently recovered to well above 10.5m b/d. Imports into China and India have surged by around 0.5m b/d and 0.8m b/d respectively, offsetting much of the withdrawal of other buyers. The EU has announced a ban on Russian imports and the UK/EU is to ban insurance of Russian seaborne cargoes worldwide. Though these measures only come into force from late this year and we believe the Chinese and Indian refining systems could well absorb another 1.0-1.5m b/d of Russian imports between them. Second, there's a growing need for crude products as travel is picking up but the cautious reopening of China's economy from stringent lockdowns caps our initial expectations of a buoyant post-COVID recovery.

STRUCTURAL UNDERINVESTMENT HAS MEANT OPEC+ SPARE CAPACITY IS RUNNING AT ULTRA THIN LEVELS

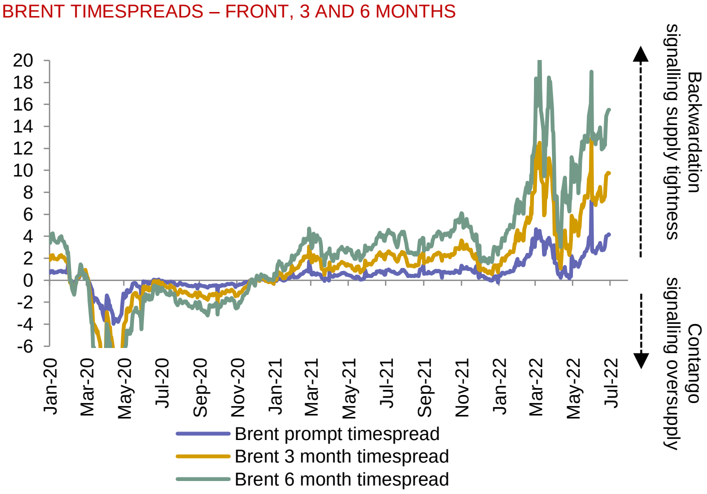
OPEC+ SPARE PRODUCTION CAPACITY (M B/D) AND BRENT (USD/B)




Source: Bloomberg, MUFG Research

OIL TIMESPREADS WIDENING INTO DEEPER BULLISH BACKWARDATION DESPITE RECESSION ANGST

BRENT TIMESPREADS – FRONT, 3 AND 6 MONTHS




Source: Bloomberg, MUFG Research

## Natural gas

**Volatility in European gas markets has been immense since the war in Ukraine began with Germany raising its three stage emergency gas status to stage 2 a critical development**

European gas markets remain on edge with Russian gas supplies falling fast. Since 14 June when Russia cut NordStream 1 pipeline flows by 60% (from 155mcm/d to 62mcm/d) citing issues with turbines undergoing maintenance by Siemens Energy in Canada (sanctions have made it difficult to return it), European natural gas (TTF) prices have rallied ~60% to three month highs of ~EUR130/MWh (see here). On 23 June, the German government raised its emergency status to stage two (out of three) as the disruption has resulted in a 30% decline in Germany's overall gas imports and has made it more challenging for utilities to fill their inventories ahead of the high demand winter heating season. The German economy minister Habeck, went so far as warning of a "Lehman effect in the energy system" from Russian gas curbs. Adding to the panic, Canada's Natural Resources Minister declared that the Gazprom turbine that Siemens Energy is repairing will not return to Russia soon.

**Race against time to fill European inventories**

The European gas market had been looking as though it was in better shape in recent months. Storage was filling up at a good pace, which has seen the gap in inventory levels narrowing significantly to the five-year average – currently 55% full and back to normal levels ahead of summer. This in turn has seen prices coming off from the high levels we saw following Russia's invasion of Ukraine. However, this has abruptly changed. European TTF prices have rallied +58%, which has taken prices back above ~EUR130/MWh – levels last seen back in early March.

**The EU is pushing for cuts in gas demand to prevent a winter of discontent as Russian supplies are dwindling**

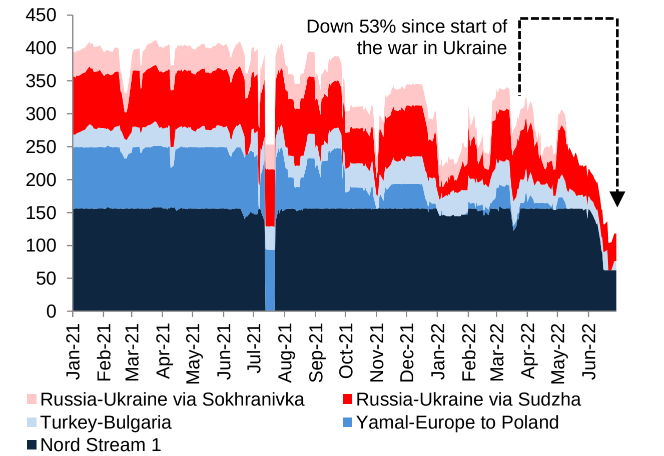
The EU is seeking ways to reduce natural gas demand and refill depleted inventories to avoid splintering global energy markets as dwindling supplies from Russia test the bloc's unity in response to the war in Ukraine. Both EU energy commissioner Simson and German economy minister Habeck urged more energy savings and efficiency to reduce the threat of gas rationing this winter, appealing to European solidarity.

**Should Nord Stream 1 remain offline past July, then we could witness European TTF prices north of EUR200/MWh for demand destruction to rebalance the market given the EU will hard it hard pressed to meet its winter inventory targets**

While our base case remains that such maintenance and restricted flows will only last until mid-July – during which time there will be a scheduled annual maintenance shutdown of NordStream 1 between 11-21 July – we recognise markets are in uncharted territory with uncertainties abound. Should these significantly reduced flows persist past July, then we believe Europe will find it hard pressed to meet its target of attaining gas inventory levels to 80% by 1 November (note Germany's own gas storage target is slightly more prudent at 90% filled by November). In such a scenario, we are convicted that European TTF prices will need to rise north of EUR200/MWh for demand destruction to rebalance the market.

RUSSIAN GAS SHIPMENTS TO EUROPE THROUGH KEY ROUTES ARE DOWN 53% SINCE INVASION AND AT RISK

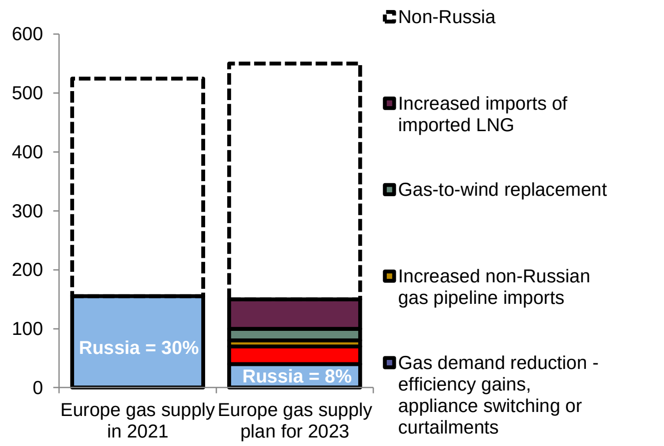
RUSSIAN PIPED NATURAL GAS SUPPLY TO EUROPE (MCM/D)




*Source: Bloomberg, MUFG Research*

THE EU PLAN TO REDUCE RELIANCE ON RUSSIAN GAS IS AMBITIOUS BUT RESOLUTE IN CONVICTION

EUROPEAN GAS SUPPLY (BILLION CUBIC METRES)




*Source: Bloomberg, MUFG Research*

## Carbon markets

After some deliberations the European Parliament has formally adopted its position on the EU's emission trading

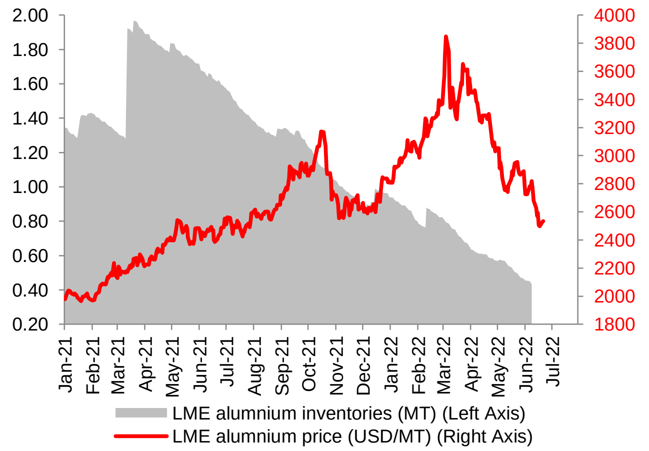
European Parliament formally adopted its position on three key EU laws that are part of the "Fit for 55 in 2030 package" on 22 June – (i) Emission Trading Reform; (ii) proposals for the EU Carbon Border Adjustment Mechanism (CBAM) and; (iii) Social Climate Fund. Three key highlights stand-out. First, the European Parliament highlighted that they want to increase the Commission's overall ambition to reduce emissions in the ETS sectors by 63% from 61% by 2030, compared to 2005. This is to be achieved through further one-off cuts to the EU-wide quantity of allowances in circulation, in combination with an increase in the annual reduction of allowances to 4.4% until the end of 2025, rising to 4.5% from 2026 and to 4.6% from 2029. Second, the ETS is to be extended to include maritime transport – 100% of emissions from intra-European routes as of 2024 and 50% of emissions from extra-European routes from and to the EU of 2024 until the end of 2026. Third, the free allowances in the ETS sectors covered by CBAM should be phased out from 2027 and disappear by 2032 when Parliament wants the mechanism to be fully implemented. Following the initial setback, the final European Parliament position has been passed with stronger reform than the original draft text. The next step will be for Parliament to negotiate with member states, and then move to subsequent discussions that are needed to pass changes to the ETS legislation into formal law. From a price perspective, we maintain our forecast for EU ETS to average EUR81/MT in 2022 and EUR91/MT next year.

The EU has taken an important step to phase out internal combustion engines by 2035

In a separate development, the EU has endorsed a push to eliminate carbon emissions from new cars by 2035, heralding the end of the era of the internal combustion engine. Environment ministers The agreement defines member states' negotiating stance for further talks with the European Parliament and the Commission on the final contours of the bloc's "Fit for 55 in 2030 package". However, with EU policymakers already in favour of giving up fossil fuels in the auto industry, it's high likely that most auto manufacturers will have to shift to producing electric models a little more than a decade. In an attempt to enable a compromise, Germany had proposed adding in a non-binding clause of the auto emissions law that calls on the Commission to proposed registering vehicles running exclusively on carbon-neutral fuels after 2035.

ALUMINIUM PRICES HAVE EASED BACK BUT THE DRAIN ON INVENTORIES IS SEVERE – PATH TO SCARCITY

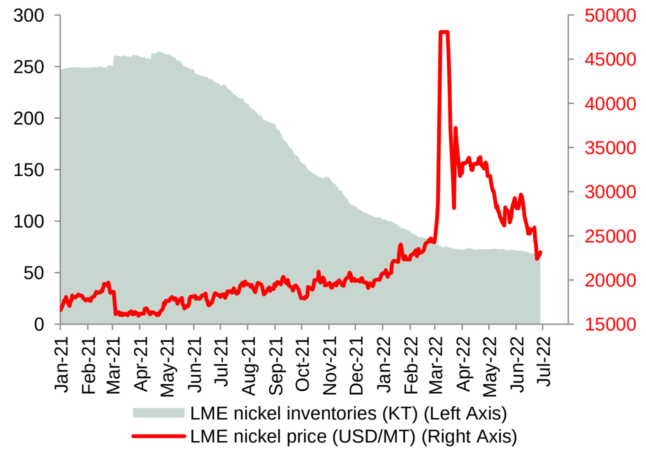
ALUMINIUM PRICE (USD/MT) AND INVENTORIES (MT, THOUSANDS)




*Source: Bloomberg, LME, MUFG Research*

NICKEL INVENTORIES HAVE SHARPLY FALLEN WITH PRICES FINDING A NEW NORMAL PATH POST-SQUEEZE

NICKEL PRICE (USD/MT) AND INVENTORIES (MT, THOUSANDS)




*Source: Bloomberg, LME, MUFG Research*

## BASE METALS (-6.0% W/W; -7.1% YTD)

### Aluminium

Aluminium continues to edge lower on a bearish global macro outlook

Along with other base metals, aluminium has given up its year-to-date gains. Many of the bear case risks have played out for aluminium, with Chinese smelters ramping faster than expected, minimal disruption to Russian supplies and weaker China demand on extended lockdowns. With the pullback in prices, we consider aluminium could be sensitive to any additional supply shocks going forward. Reported inventories have continued to draw through H1 2022, leaving little buffer in the market. There have also been small curtailments at smelters in Australia on power shortfalls, while China is potentially facing a shortage of high-energy coal. What's more, Chinese smelter margins are moderating, which could reduce China's exports. Finally, the impact of the war in Ukraine could be yet to come with higher European power prices expected to keep some capacity curtailed into 2023, while it is not clear whether Russia's alumina needs will continue to be met by China to make up lost volumes from both Ukraine and Australia. More broadly, aluminium's cyclical headwinds do not change the structural story. That is, structural fundamentals remain intact – the underlying playbook for ongoing outperformance in aluminium is clear as their role in the decarbonisation process is central (and unprepared). Greening the economy will support a surge in aluminium (and broader base metals) demand but sticky inadequate supply widens deficits, inducing a multi-year supercycle (see here). For now, we maintain our aluminium prices averaging USD3,633/MT this year.

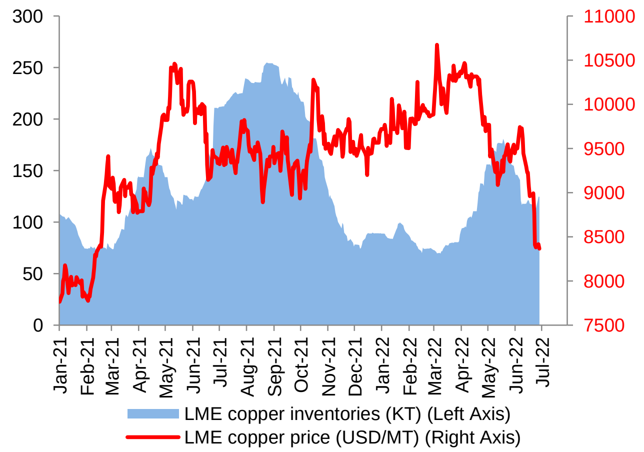
### Nickel

The dust has yet to settle on nickel

Nickel's epic surge in March and roller-coaster since has eased but not yet closed, with significant liquidity being withdrawn on the LME. Notwithstanding weak end-use demand, China's stainless steel output is holding up well (-1.4% y/y in May). Looking one level lower, less stainless scrap and more Indonesian NPI is finding its way into China's stainless steel. In tandem, ex-China stainless production is modestly up. We believe the recovery in nickel demand beyond China's lockdowns will mainly have to be driven by a recovery in the EV sector. At the beginning of the year, nickel's place within green metals was as a key competitor in the race for mineral dominance of energy storage. Now, it sits at the intersection of Europe's push for decarbonisation and energy independence. At the heart of Europe's strategy lies its desire to rapidly electrify its transportation sector – a source of ~20% of its emissions and ~2m b/d of

COPPER INVENTORIES ARE IN A STATE OF ACUTE DEPLETION WITH UPSIDE PRICE RISKS IMMENSE

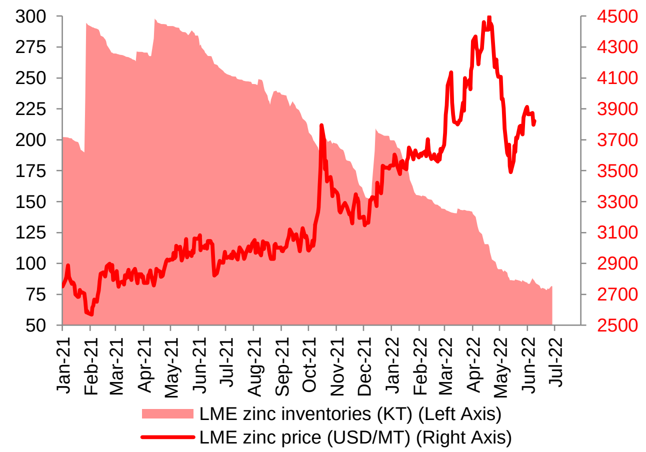
COPPER PRICE (USD/MT) AND INVENTORIES (MT, MILLIONS)




*Source: Bloomberg, LME, MUFG Research*

ZINC INVENTORIES HAVE BEEN LOW THROUGHOUT THE PANDEMIC WITH PRICES SIGNIFICANTLY RISING

ZINC PRICE (USD/MT) AND INVENTORIES (MT, MILLIONS)




*Source: Bloomberg, LME, MUFG Research*

Russian oil imports. With Europe's domestic EV sector already favouring nickel-based batteries, nickel is set to benefit the most from politically motivated demand accelerating already rapid growth in nickel battery use. In the medium term, we forecast the market turning to surplus as supply growth outpaces demand. With this, we have recently lifted our price forecast trajectory but we still expect the price easing into year-end (MUFG average Q4 2022 forecast USD26,000/MT).

## Copper

Copper – the bellwether for the global economy – has ricocheted into a bear market

Copper – the bellwether for the global economy – has ricocheted into a bear market amid a deteriorating global macro outlook. For much of the last decade, there's been a relationship between US 10 year yields and the ratio of copper-to-gold. Markets witnessed a large divergence in early 2021 and the copper-to-gold ratio soared, while the rate move was muted. Fast forward to today, and the opposite is the case. The copper-to-gold ratio has fallen notably in recent months with recession fears on the rise. Rates have come in a tad, but they're still elevated. At the current juncture, the copper-to-gold ratio may be signalling that the Fed's hawkish turn may run into tension against slowing economic activity. While copper demand concerns remain overly tied to global growth reservations, copper supply concerns have waned with reports of the continued flow of Russian metal alongside a broader expectation for stronger global mine output over the next couple of years. We view this supply narrative is misguided. On Russia, we believe such a short-term continuation of flows – unlike those seen in grains or energy – hides a deeper contraction in potential Russian mine supply. With equipment and key personnel barred from the region, alongside more restrained capital, we believe that there will be considerable disruptions to Russia's mine supply from 2023 onwards. Such supply disruptions is the premise of our bullish conviction (MUFG average Q4 2022 forecast USD11,900/MT). Looking ahead, we continue to see copper prices as substantially underpriced given persistent tightening micro trends in China even through lockdowns. Such supply disruptions is the premise of our bullish conviction (MUFG average Q4 2022 forecast USD11,900/MT).

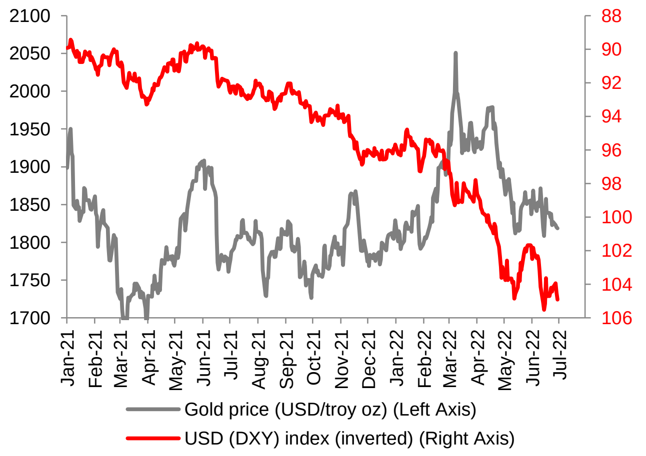
## Zinc

Zinc has performed best amongst base metal peers

Relative to its base metals peers, zinc has held up best (albeit it is still marginally down year-to-date) as smelter curtailments and low inventories have kept the market

GOLD HAS FALLEN ON A MODERATELY HIGHER USD AND RISING YIELDS AMID THE FED'S HAWKISH STANCE

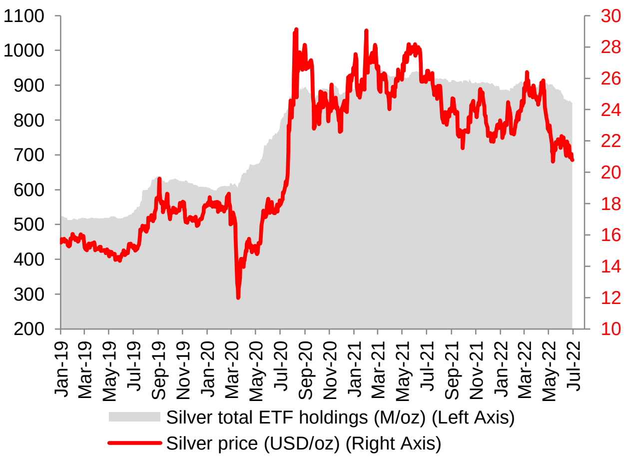
GOLD PRICE (USD/OZ) VS US USD BROAD (DXY) INDEX




*Source: Bloomberg, MUFG Research*

DESPITE STEADY INDUSTRIAL DEMAND, SILVER REMAINS DRIVEN BROADLY BY GEOPOLITICS

SILVER PRICE (USD/OZ) VS SILVER TOTAL ETF HOLDINGS (M/OZ)




*Source: Bloomberg, MUFG Research*

tight. Despite market sentiment deteriorating due to the near-term demand outlook, the refined market tightness has not yet eased. In addition, LME reportable stocks have continued to fall due to persistent tightness in the market. More broadly, zinc fundamentals continue to remain exceedingly tight. The war in Ukraine has resulted in higher fuel and power prices, which has led to the closure of smelters. This has caused tightness in the smelter market, resulting in an increase in treatment charges. On net, we maintain our bullish forecasts though expect a slight pullback given prices appear to have overshot fundamentals somewhat (MUFG average 2022 forecast USD3,853/MT).

## PRECIOUS METALS (-1.8% W/W; -2.8% YTD)

### Gold

Gold has been directionless on

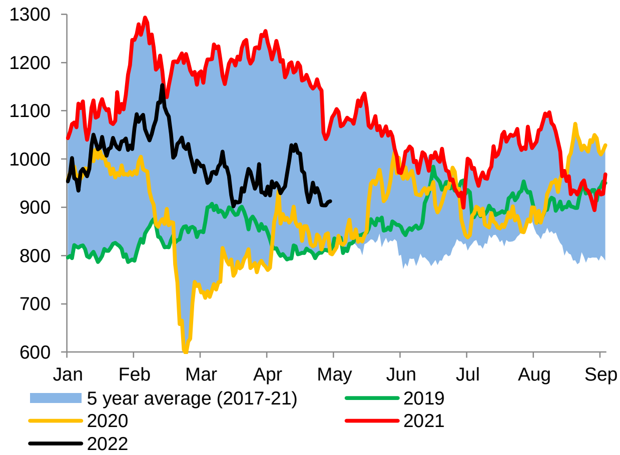
Gold has been range-bound this week as USD and yields are offering little direction. The G7 countries announced a ban on Russian gold imports, which at face value sounds significant – Russia is the third largest producer globally – but ultimately is largely symbolic given the low relevance of supply when it comes to gold price formation. Also, the London Bullion Market Association (LBMA) already suspended the accreditation of Russian gold refiners back in March. While the LBMA's action and sanctions on Russian banks after the invasion of Ukraine have largely closed European and US markets to gold from Russia, the G7 pledge would mark a total severance between it and the world's top two trading centres, London and New York.

A confluence of demand factors are supportive for gold

Looking ahead, we reiterate our call that gold is facing the most bullish backdrop in 10 years, as (i) investments; (ii) central banks and (iii) consumer demand appears set to simultaneously thrive – the last time these three forces came together in 2010-11, gold rallied ~70%. First, we are already seeing strong momentum in gold ETF demand, which should build further as US growth slows. Second, we also expect gold central bank demand to pick up in the second half of the year, after the RUB stabilises, as Russia should have meaningful liquidity to ramp up its gold purchases Third, Asian consumer demand was very strong in H2 2021, and should only get stronger in our view, on greater wealth and a lack of investment option. We believe that gold prices will now accelerate from current levels (MUFG average Q4 2022 forecast USD2,250/oz).

PLATINUM'S OUTLOOK REMAINS CONSTRUCTIVE ON A STEADY BALANCING PATH WITH UPSIDE SUPPLY RISKS

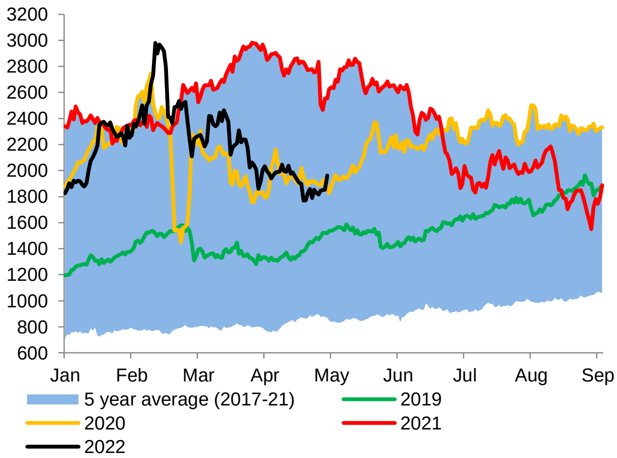
PLATINUM SPOT PRICE (USD/MT)




*Source: Bloomberg, MUFG Research*

PALLADIUM HAS LARGE UPSIDE RISKS – ULTIMATE GEOPOLITICAL HEDGE – RUSSIA IS THE TOP PRODUCER

PALLADIUM SPOT PRICE (USD/MT)




*Source: Bloomberg, MUFG Research*

## Silver

Silver has followed gold lower

As with gold, silver has remained flat for much for the same reasons. The gold-silver ratio has seen a strong reversal, with a larger downward move in silver positioned for inflation and growth risks while the industrial demand outlook has weakened with China's lockdowns. Also similar to gold, silver has seen a collapse in CFTC positioning, although ETF holdings have only moved gradually lower. Bar and coin demand was also robust last year. Silver should benefit on a medium-term view from energy transition-related demand, particularly for its use in solar. However, given the broader risks to global growth with a backdrop of rising rates, the near-term outlook may be more challenged. Going forward, we believe silver is set to slightly outperform gold on stronger industrial demand and will gain more broadly on the rotation towards precious metals as a defensive asset during a stagflationary environment (MUFG average Q4 2022 forecast USD30/oz).

## Platinum and palladium

Palladium and platinum still look undervalued

Both core PGMs – platinum and palladium – continue to ease on recession angst but they still look undervalued. Last year PGMs were well supplied as chip shortages weighed on demand. Global auto production remains weak but most forecasts assume a recovery into the second half of the year. However, the extent of the recovery will be impacted by the speed of the return of China from lockdowns as well as whether constraints in semiconductor chips continue to ease with supply chain disruptions looming. What's more, the role of China (and to a lesser extent India) will be critical to the remapping of PGMs (should self-sanctioning broaden in this space – which has yet to materially occur with negligible disruptions in PGM flows). Though, China's demand for Russian commodities does not fully line up with its own supply which will complicate the part re-mapping of the global commodities landscape in the quarters ahead (see here).

# BULK COMMODITIES (-1.2% W/W; 12.3% YTD)

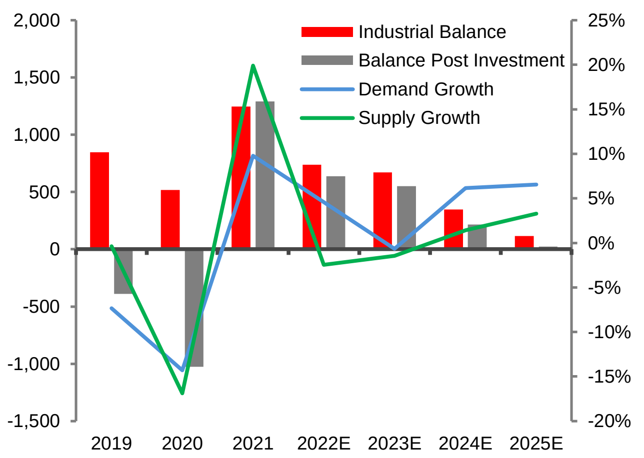
## Iron ore

Iron ore weak on China and steel glut

Iron ore prices have fallen significantly from their year-to-date high of USD171/MT

PLATINUM'S SURPLUS WILL LIKELY LAST UNTIL 2025 ON TIGHTENING EMISSIONS AND PALLADIUM SUBSTITUTION

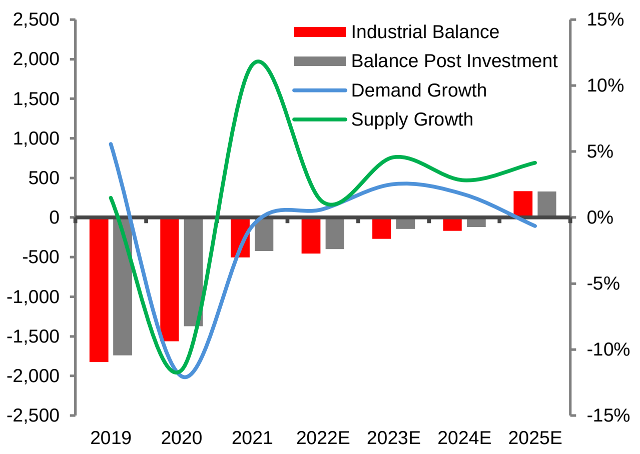
PLATINUM SUPPLY-DEMAND BALANCE (THOUSAND OUNCES, % Y/Y)




*Source: Bloomberg, MUFG Research*

PALLADIUM'S DEFICIT IS SET TO NARROW BEFORE PIVOTING INTO SURPLUS BY 2025 STRONG SUPPLY

PALLADIUM SUPPLY-DEMAND BALANCE (THOUSAND OUNCES, % Y/Y)




*Source: Bloomberg, MUFG Research*

seen back in March to ~USD130/M. China's COVID lockdown impositions have seen stern restrictions, which have not been supportive for demand. In addition, there are growing concerns over the macro outlook. Soaring inflation is seeing central banks, particularly the Fed having to take a more aggressive approach to monetary tightening. The concern is that the Fed will struggle to rein in inflation without pushing the US economy into recession. Ultimately though the iron ore outlook is going to largely depend on how China approaches any further COVID outbreaks through the year as well as the scale of stimulus we see the government unleashing.

## Coal

"Back-to-black" trade continues with coal prices well-supportive

The "back-to-black" trade continues with coal prices well-supportive as European countries position for delicate gas-to-coal switching given precipitously falling Russian gas flows and a tight LNG market following an outage at the US Freeport LNG terminal. Europe finds itself in the centre of the coal market, and the longer-term trend of shifting seaborne demand to Asia is likely to be temporary reversed. Beyond having to replace almost 50/MT of Russian coal, Europe will also have to find more coal overall given the gas-to-coal switching. Russia's coal shipments are down about 10% year-to-date, but the real adjustment is still to come in August. After the lost month of January, recent Indonesian shipments reached the highest level since mid-2019, but its compositional coal product is not suitable for Europe's utilities, and thus Indonesia is only indirectly relieving Europe's coal needs. There is no meaningful uptick in overall exports from South Africa, Colombia and the US yet, although some initial re-routing of coal from these producers away from India towards Europe is becoming visible.

## AGRICULTURE (-4.3% W/W;15.2% YTD)

We are turning neutral-to-bearish on grains on better harvests

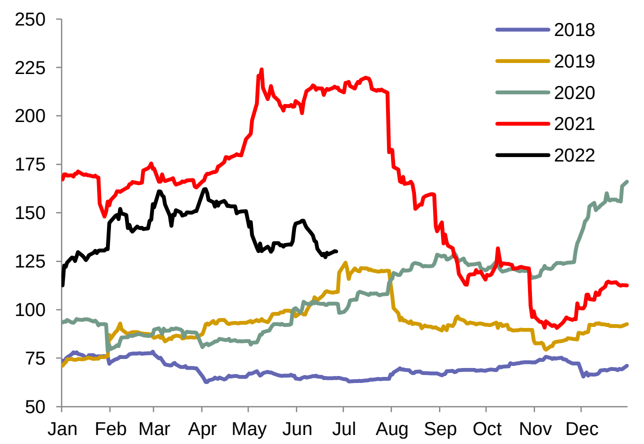
We are turning bearish-to-neutral on the grains complex – notably, wheat, corn and soybean – following a benign start to the Northern hemisphere planting season. That said, we acknowledge that there is a wide range of future food prices but what is clear is that hoarding within the agri complex may be less severe that we had anticipated in April (see here).

Hoarding reinforces bull commodities

With the sharp rise in de-globalisation, de-carbonisation and a reduction in capital

IRON ORE PRICES HAVE STARED ROBUSTLY IN 2022 BUT NOW SUFFERING FROM IRRATIONAL EXUBERANCE

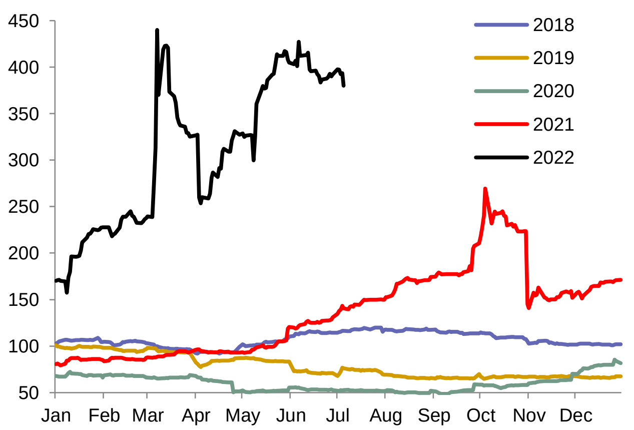
IRON ORE SPOT PRICE (USD/MT)




*Source: Bloomberg, MUFG Research*

COAL PRICES HAVE EXTENDED THEIR SURGE AS THE WORLD DOUBLES DOWN ON ENERGY SECURITY

NEWCASTLE COKING COAL SPOT PRICE (USD/MT)

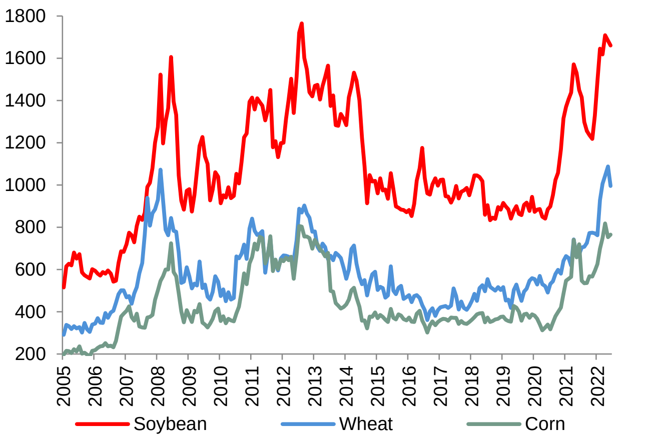



*Source: Bloomberg, MUFG Research*

availability given structural underinvestments over the years, hoarding – whilst not as severe in the agri space – reinforces the long commodities conviction. At the heart of this supposition is the need for countries to establish resiliency in their supply chains – whether in response to trade wars, climate change, geopolitical risks and/or sanctions. These pressures all lead to the same trade off, namely, inflationary pressures against the security of supply. If history is any guide, the costs of such policies will be inflationary as the pursuit of economic autarky for strategic purposes favours maintaining higher cost but more secure supply chains, over the lower cost comparative advantage model of globalisation. These shifts, and their inflationary ramifications, are just starting out, in our view.

GRAIN PRICES MAY BEGIN TO EDGE BACK ON BETTER HARVEST BUT HOARDNG A PRESSING CONCERN

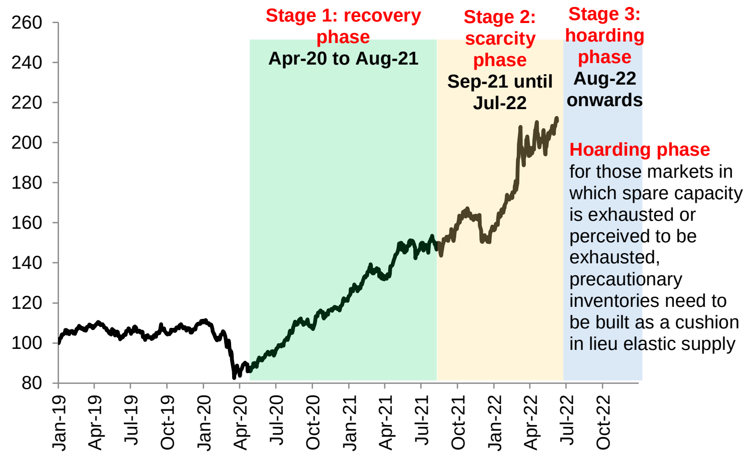
SOYBEAN, WHEAT AND CORN PRICES (USD/BUSHELS)




*Source: Bloomberg, MUFG Research*

COMMODITY MARKETS MAY PIVOT FROM DEMAND RECOVERY TO SUPPLY SCARCITY AND NOW HOARDING

BLOOMBERG COMMODITY INDEX, REBASED JANUARY 2019 = 100




*Source: Bloomberg, MUFG Research*

# Commodity prices – performance

| | Commodity | Ticker | Unit | 2021 | 2022 | | | | Change % | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commodity | Ticker | Unit | 31-Dec | 08-Jun | 15-Jun | 22-Jun | 29-Jun | Week | 1 MTD | 3 MTD | YTD | 1 Year | 3 Years | 5 years |
| 1 | Bloomberg BCOM Total Returns | BCOMTR Index | Index | 281.15 | 292.05 | 276.40 | 270.63 | 263.08 | -2.79 | -6.43 | -0.43 | 24.21 | 32.20 | 56.78 | 59.39 |
| 2 | Bloomberg BCOM Spot Index | BCOMSP Index | Index | 657.06 | 682.41 | 631.26 | 617.88 | 600.13 | -2.87 | -8.67 | -3.41 | 19.49 | 26.78 | 75.09 | 85.94 |
| 3 | Energy | BCOMENSP Index | Index | 653.18 | 708.40 | 631.00 | 603.11 | 598.82 | -0.71 | -8.32 | 13.50 | 62.34 | 67.50 | 117.01 | 151.54 |
| 4 | US Natural Gas | NG1 Comdty | USD/MMBtu | 8.15 | 9.29 | 7.19 | 6.81 | 6.57 | -3.47 | -19.28 | 23.22 | 76.27 | 81.13 | 184.88 | 116.14 |
| 5 | EU Natural Gas | TZT1 Comdty | EUR/MMBtu | 94.00 | 79.61 | 97.04 | 125.56 | 140.50 | 11.90 | 49.46 | 29.64 | 99.74 | 319.58 | 1288.75 | 838.23 |
| 6 | WTI Crude | CL1 Comdty | USD/b | 114.67 | 119.41 | 118.93 | 110.65 | 112.35 | 1.54 | -2.01 | 7.80 | 49.41 | 53.97 | 92.18 | 150.10 |
| 7 | Brent Crude | CO1 Comdty | USD/b | 122.84 | 120.57 | 121.17 | 114.65 | 118.59 | 3.44 | -3.46 | 7.58 | 52.47 | 58.63 | 78.20 | 150.08 |
| 8 | Gasoline | HO1 Comdty | USD/lb | 222.85 | 415.77 | 399.38 | 379.45 | 383.03 | 0.94 | -6.13 | 19.57 | 71.88 | 71.07 | 97.18 | 157.83 |
| 9 | EU ETS EUA | MO1 Comdty | USD/gal | 80.22 | 80.98 | 83.78 | 84.27 | 87.12 | 3.38 | 4.14 | 8.17 | 8.60 | 57.26 | 231.76 | 1667.14 |
| 10 | Metals | BCOMIN Index | Index | 172.89 | 187.68 | 172.25 | 170.89 | 160.57 | -6.04 | -13.46 | -23.08 | -7.13 | 2.82 | 41.95 | 40.84 |
| 11 | Industrial Metals Index | BCOMINSP Index | Index | 303.57 | 329.20 | 302.92 | 300.54 | 281.12 | -6.46 | -13.63 | -23.13 | -7.39 | 2.38 | 47.51 | 50.18 |
| 12 | Copper | HG1 Comdty | USD/lb | 9,721 | 9,699 | 9,231 | 8,995 | 8,366 | -7.00 | -11.45 | -19.10 | -13.94 | -10.89 | 39.59 | 42.25 |
| 13 | Aluminium | LA1 Comdty | USD/MT | 2,803 | 2,749 | 2,554 | 2,524 | 2,476 | -1.92 | -10.42 | -31.34 | -11.67 | -0.30 | 38.91 | 31.13 |
| 14 | Zinc | ZNC1 Comdty | USD/MT | 3,580 | 3,801 | 3,605 | 3,618 | 3,368 | -6.91 | -14.28 | -17.72 | -5.92 | 16.37 | 32.34 | 23.08 |
| 15 | Nickel | LN1 Comdty | USD/MT | 20,874 | 29,413 | 25,197 | 25,901 | 23,119 | -10.74 | -18.45 | -29.33 | 10.76 | 26.44 | 82.90 | 150.33 |
| 16 | Precious Metals Index | BCOMPRSP Index | Index | 530.97 | 530.10 | 515.29 | 525.36 | 516.02 | -1.78 | -2.00 | -7.67 | -2.82 | -2.32 | 30.74 | 41.32 |
| 17 | Gold | GC1 Comdty | USD/t oz | 1,829 | 1,847.50 | 1,809.50 | 1,834.60 | 1,817.40 | -0.94 | -1.36 | -4.94 | -0.60 | 3.07 | 28.58 | 45.91 |
| 18 | Silver | SI1 Comdty | USD/t oz | 23.35 | 22.18 | 20.95 | 21.77 | 20.58 | -5.46 | -5.11 | -16.73 | -11.87 | -20.45 | 34.92 | 24.08 |
| 19 | Platinum | PL1 Comdty | USD/t oz | 964.40 | 1,012.90 | 910.70 | 939.50 | 910.40 | -3.10 | -5.64 | -6.09 | -5.26 | -14.41 | 9.36 | -0.58 |
| 20 | Palladium | PA1 Comdty | USD/t oz | 1,912 | 1,956 | 1,772 | 1,854 | 1,853 | -0.02 | -2.25 | -7.53 | 1.98 | -27.27 | 26.82 | 130.47 |
| 21 | Bulk Commodities | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22 | Hard Coking Coal | XW1 Comdty | USD/MT | 341.76 | 418.00 | 386.33 | 385.50 | 372.83 | -3.29 | -25.77 | -37.36 | 8.99 | 114.08 | 89.73 | 153.40 |
| 23 | Iron Ore | SCO1 Comdty | USD/MT | 112.50 | 145.81 | 138.26 | 128.93 | 130.11 | 0.92 | -2.55 | -13.44 | 15.65 | -39.33 | 19.17 | 132.75 |
| 24 | Agriculture | BCOMAG Index | Index | 60.79 | 75.93 | 75.16 | 73.14 | 70.03 | -4.25 | -7.11 | -3.37 | 15.20 | 26.34 | 68.54 | 39.22 |
| 25 | Agriculture Index | BCOMAGSP Index | Index | 406.67 | 503.17 | 475.06 | 462.25 | 440.23 | -4.76 | -11.89 | -8.95 | 8.25 | 20.77 | 70.58 | 71.39 |
| 26 | Grain Index | BCOMGRSP Index | Index | 293.87 | 387.37 | 366.39 | 352.13 | 335.61 | -4.69 | -12.84 | -8.38 | 14.21 | 24.70 | 67.34 | 77.04 |
| 27 | Soybean | S 1 Comdty | USD/bu | 1,328.75 | 1,728 | 1,699 | 1,681 | 1,679 | -0.10 | -0.24 | 2.21 | 26.38 | 23.50 | 86.64 | 83.42 |
| 28 | Wheat | W 1 Comdty | USD/bu | 770.75 | 1,071.75 | 1,050.25 | 975.25 | 919.00 | -5.77 | -15.49 | -9.39 | 19.23 | 43.65 | 74.05 | 91.36 |
| 29 | Corn | C 1 Comdty | USD/bu | 593.25 | 757.00 | 768.25 | 760.75 | 768.75 | 1.05 | 1.96 | 5.78 | 29.50 | 10.62 | 82.81 | 113.55 |
| 30 | Soft Index | BCOMOSSP Index | Index | 394.34 | 419.02 | 402.05 | 400.48 | 373.35 | -6.77 | -11.87 | -8.76 | -5.32 | 19.01 | 68.17 | 55.08 |
| 31 | Cotton | CT1 Comdty | USD/lb | 112.60 | 136.95 | 143.48 | 143.51 | 105.00 | -26.83 | -24.45 | -23.25 | -6.75 | 21.40 | 66.27 | 41.89 |
| 32 | Coffee | KC1 Comdty | USD/lb | 226.10 | 232.15 | 226.95 | 233.10 | 227.65 | -2.34 | -1.56 | 5.54 | 0.69 | 42.55 | 110.30 | 82.48 |
| 33 | Sugar | SB1 Comdty | USD/lb | 18.88 | 18.97 | 18.70 | 18.66 | 18.42 | -1.29 | -5.05 | -3.61 | -2.44 | 6.91 | 49.51 | 38.50 |
| 34 | Livestock Index | BCOMLISP Index | Index | 196.83 | 212.94 | 208.45 | 215.38 | 207.37 | -3.72 | -0.48 | -9.44 | 5.36 | 6.01 | 29.80 | 18.84 |
| 35 | Live Cattle | LC1 Comdty | USD/lb | 138.90 | 133.73 | 135.20 | 137.83 | 136.30 | -1.11 | 4.48 | -3.21 | -1.82 | 11.28 | 23.42 | 13.46 |
| 36 | Lean Hogs | LH1 Comdty | USD/lb | 81.48 | 108.43 | 108.45 | 112.73 | 109.93 | -2.48 | 1.27 | 3.11 | 34.21 | 2.22 | 51.66 | 22.21 |
| 37 | USD Index | DXY Index | Index | 95.67 | 102.32 | 105.52 | 104.44 | 104.93 | 0.47 | 3.12 | 6.63 | 9.68 | 13.99 | 9.16 | 9.73 |

*Source: Bloomberg, MUFG Research*



MUFG

## Commodity prices – quarterly and annual forecasts

| | Commodity | Ticker | Unit | 29-Jun Spot | Q1-22 | Q2-22 | Q3-22 | Q4-22 | Q1-23 | Q2-23 | Q3-23 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Quarter Averages | | | | | | | Annuals | | | |
| 1 | Energy | | | | | | | | | | | | | | |
| 2 | US Natural Gas | NGA Comdty | USD/MMBtu | 6.55 | 4.58 | 7.10 | 4.50 | 5.10 | 5.30 | 4.00 | 4.10 | 3.72 | 5.32 | 4.62 | 3.96 |
| 3 | EU Natural Gas | TZTA Comdty | EUR/MWh | 129.18 | 96.50 | 96.00 | 104.00 | 88.00 | 117.00 | 76.00 | 72.00 | 29.13 | 119.74 | 71.80 | 60.00 |
| 4 | EU ETS EUA | MOA Comdty | EUR/MT | 84.59 | 95.93 | 135.91 | 102.50 | 144.60 | 138.00 | 95.00 | 89.00 | 53.46 | 80.97 | 91.00 | 98.00 |
| 5 | WTI Crude | CLA Comdty | USD/b | 111.76 | 94.77 | 119.60 | 136.00 | 108.00 | 106.00 | 95.00 | 98.00 | 68.00 | 114.59 | 102.25 | 95.20 |
| 6 | Brent Crude | COA Comdty | USD/b | 117.98 | 97.90 | 124.60 | 141.00 | 112.00 | 110.00 | 98.50 | 102.00 | 70.85 | 118.88 | 106.13 | 98.40 |
| 7 | | | | | | | | | | | | | | | |
| 8 | Copper | LMCADS03 Comdty | USD/lb | 8.418 | 9,974 | 10,780 | 11,360 | 11,900 | 12,150 | 12,250 | 12,400 | 9,292 | 11,003 | 12,310 | 11,500 |
| 9 | Aluminium | LMAHDS03 Comdty | USD/MT | 2,480 | 3,254 | 3,700 | 3,780 | 3,800 | 3,910 | 4,000 | 3,950 | 2,477 | 3,633 | 3,980 | 3,700 |
| 10 | Zinc | LMZSDS03 Comdty | USD/MT | 3,349 | 3,727 | 4,100 | 3,950 | 3,650 | 3,700 | 3,750 | 3,780 | 3,016 | 3,857 | 3,760 | 3,900 |
| 11 | Nickel | LMNIDS03 Comdty | USD/MT | 22,846 | 28,302 | 29,500 | 28,000 | 26,000 | 27,500 | 27,000 | 29,000 | 18,457 | 27,951 | 27,900 | 26,500 |
| 12 | Precious Metals | | | | | | | | | | | | | | |
| 13 | Gold | XAU Comdty | USD/t oz | 1,818 | 1,879 | 2,030 | 2,115 | 2,250 | 2,280 | 2,060 | 2,030 | 1,799 | 2,068 | 2,090 | 1,900 |
| 14 | Silver | XAG Comdty | USD/t oz | 20.81 | 24.11 | 26.60 | 27.50 | 29.00 | 30.00 | 28.00 | 27.60 | 25.16 | 26.80 | 28.20 | 26.95 |
| 15 | Platinum | XPT Comdty | USD/t oz | 904.10 | 1,030.00 | 1,140 | 1,180 | 1,215 | 1,250 | 1,190 | 1,120 | 1,089 | 1,141 | 1,175 | 1,210 |
| 16 | Palladium | XPD Comdty | USD/t oz | 1,853.40 | 2,315 | 2,900 | 3,150 | 3,360 | 3,250 | 3,200 | 3,290 | 2,391 | 2,931 | 3,255 | 3,100 |
| 17 | | | | | | | | | | | | | | | |
| 18 | Hard Coking Coal | IACA Comdty | USD/MT | 373.50 | 433.98 | 506.00 | 470.00 | 410.00 | 405.00 | 380.00 | 390.00 | 188.50 | 455.00 | 380.00 | 350.00 |
| 19 | Iron Ore | SCOA Comdty | USD/MT | 130.28 | 141.15 | 158.00 | 140.00 | 115.00 | 95.00 | 90.00 | 80.00 | 159.83 | 138.54 | 86.50 | 97.00 |
| 20 | | | | | | | | | | | | | | | |
| 21 | Soybean | BOA Comdty | USD/bu | 1,664 | 1,559 | 1,740 | 1,590 | 1,550 | 1,520 | 1,500 | 1,475 | 1,375 | 1,610 | 1,505 | 1,460 |
| 22 | Wheat | W A Comdty | USD/bu | 921.25 | 913.80 | 1,240 | 1,215 | 1,195 | 980.00 | 920.00 | 850.00 | 683.47 | 1,141 | 910.00 | 880.00 |
| 23 | Corn | C A Comdty | USD/bu | 759.50 | 671.65 | 850.00 | 820.00 | 780.00 | 730.00 | 680.00 | 670.00 | 581.69 | 780.41 | 695.00 | 650.00 |
| 24 | Cotton | CTA Comdty | USD/lb | 100.12 | 123.43 | 129.00 | 124.00 | 118.00 | 102.00 | 98.00 | 104.00 | 93.43 | 123.61 | 104.00 | 98.00 |
| 25 | Coffee | DFA Comdty | USD/lb | 226.00 | 234.84 | 232.00 | 215.00 | 225.00 | 230.00 | 220.00 | 200.00 | 168.75 | 226.71 | 215.00 | 210.00 |
| 26 | Sugar | SBA Comdty | USD/lb | 18.30 | 18.61 | 19.20 | 18.60 | 18.50 | 18.30 | 19.00 | 18.40 | 17.86 | 18.73 | 18.50 | 17.80 |

*Source: Bloomberg, MUFG Research*

## Commodity prices – 6-12 month forward outlook, vs. spot/nearby forwards

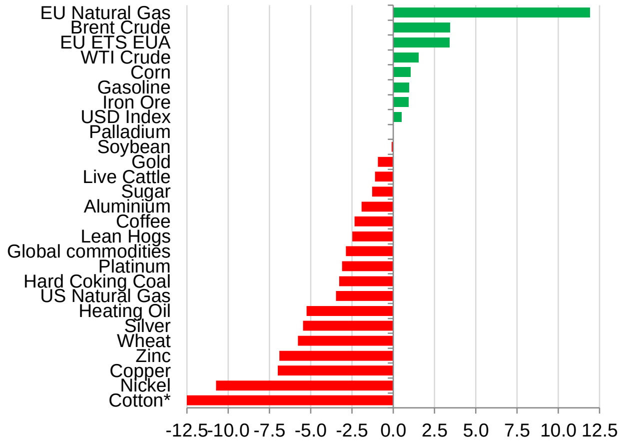
| | | Bullish | Neutral-to-bullish | Neutral | Neutral-to-bearish | Bearish |
|---|---|---|---|---|---|---|
| 1 | Energy | EU natural gas, Brent, WTI | US natural gas | --- | --- | |
| 2 | Base Metals | Aluminium, Copper, Nickel | Zinc | --- | --- | --- |
| 3 | Precious Metals | Platinum, Palladium | Gold, Silver | --- | --- | --- |
| 4 | Bulk Commodities | Hard Coking Coal | --- | Iron ore | | --- |
| 5 | Agriculture | --- | --- | --- | Soybean, Wheat, Corn, Cotton | Coffee, Sugar |

*Source: Bloomberg, MUFG Research*

# Core indicators – commodities flows and returns

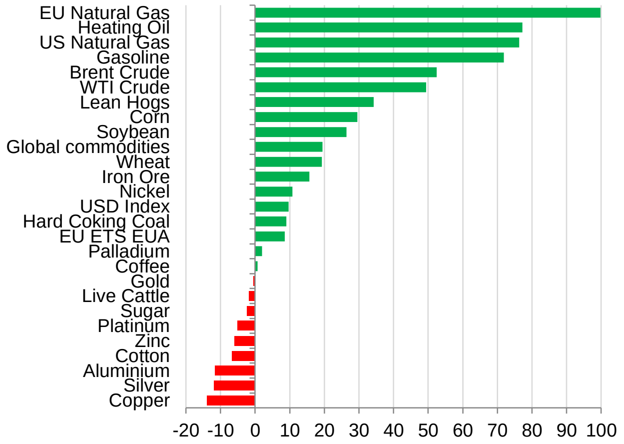
## COMMODITIES MARKET PRICE RETURNS

WEEK ENDING 29 JUNE 2022* (% W/W)



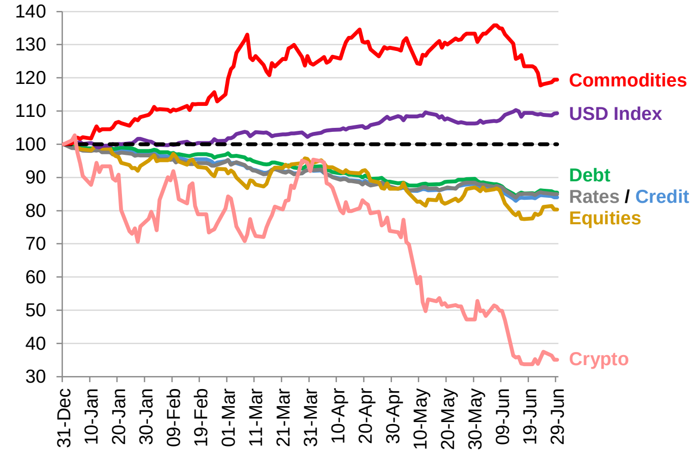

## COMMODITIES MARKET PRICE RETURNS

YEAR-TO-DATE 2022 (%)



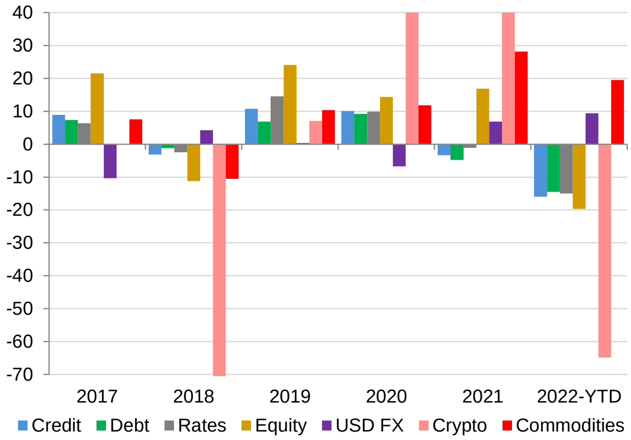

## USD-DENOMINATED GLOBAL ASSET MARKET RETURNS

REBASED 1 JANUARY 2022 = 100



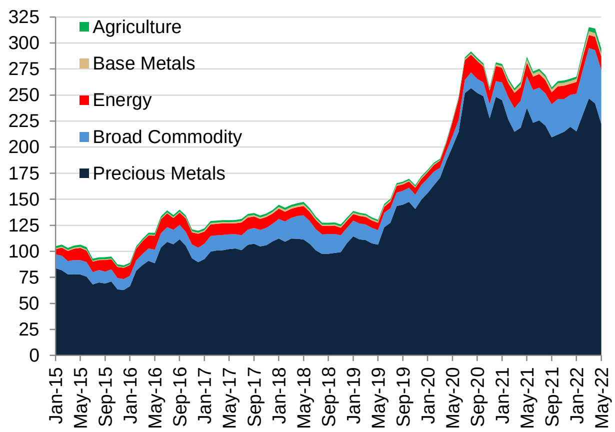

## USD-DENOMINATED GLOBALL ASSET MARKET RETURNS

ANNUALISED PERFORMANCE (%)



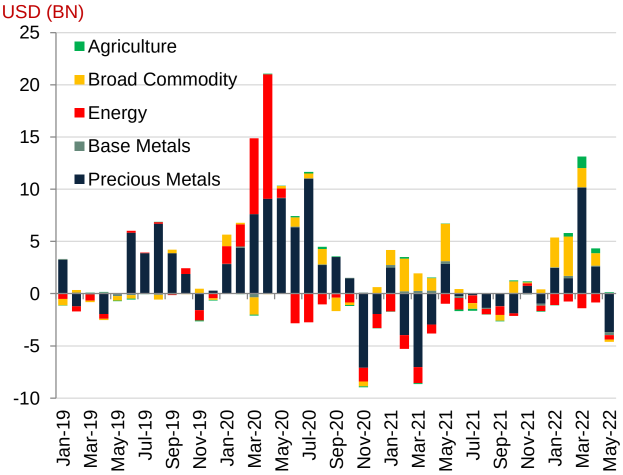

## COMMODITIES ETF COMBINED CUMULATIVE AUM

USD (BN)




## COMMODITIES ETF COMBINED CUMULATIVE FUND FLOWS

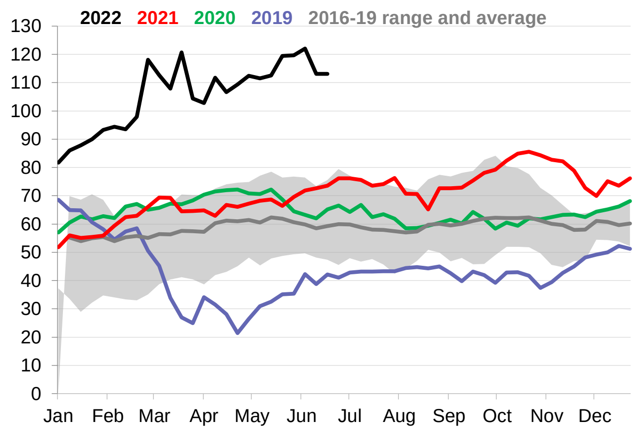
USD (BN)



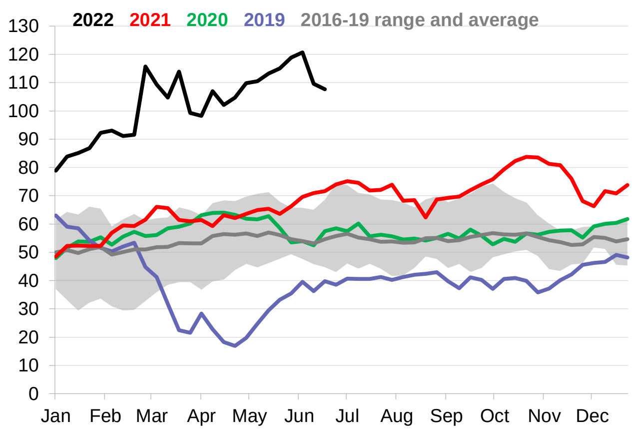

*Source: Bloomberg, MUFG Research; Cotton -26.8% w/w*

## Core indicators – prices

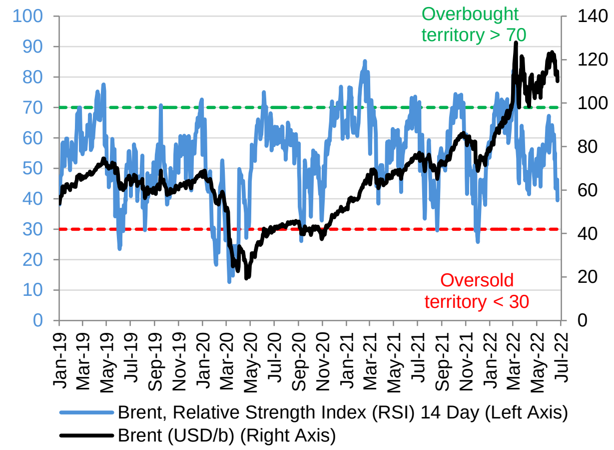
### BRENT SPOT
USD/B



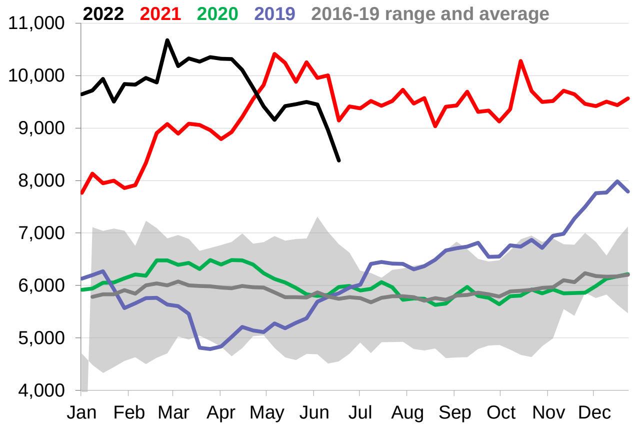

### NYMEX WTI SPOT
USD/B



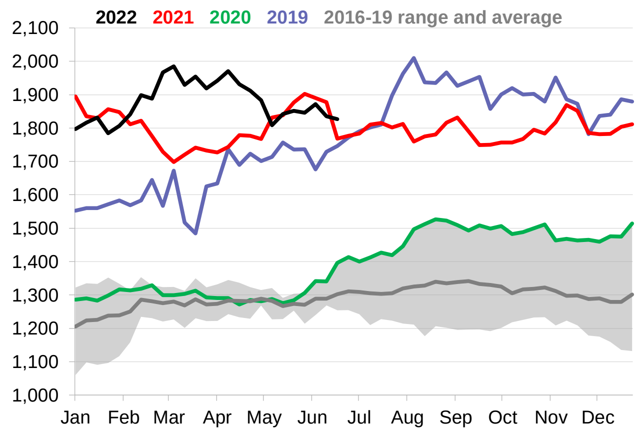

### 14 DAY RELATIVE STRENGTH INDEX (RSI) AND WTI
USD/B AND 0-100 INDEX (<30 = OVERSOLD; >70 = OVERBOUGHT)



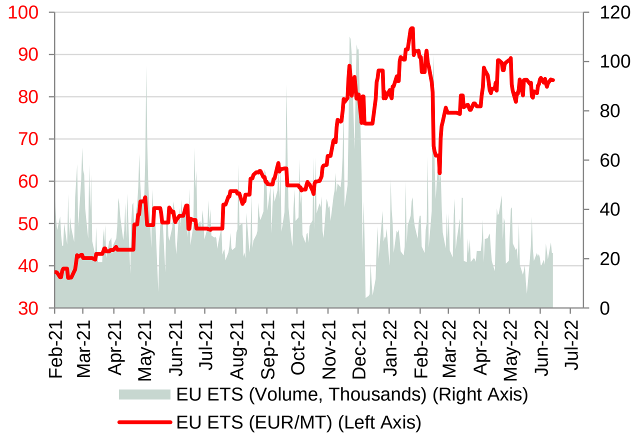

### COPPER SPOT
USD/LB




### GOLD SPOT
USD/T OZ




### EU CARBON PRICE AND VOLUME
EUR/T AND EUA'S (THOUSAND VOLUME)

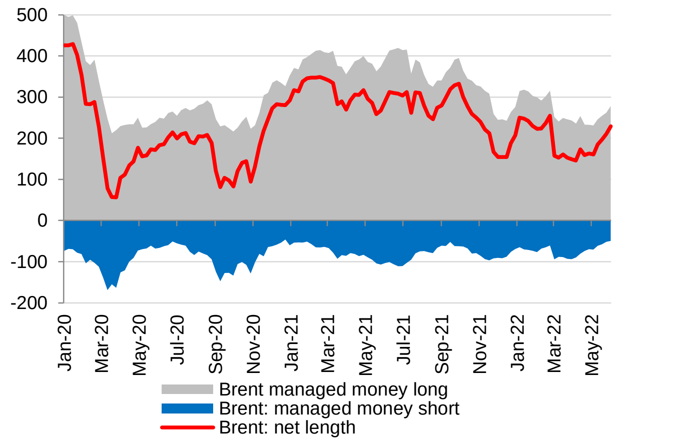



*Source: Bloomberg, EIA, IEA, OPEC, MUFG Research*

# Core indicators – market positioning

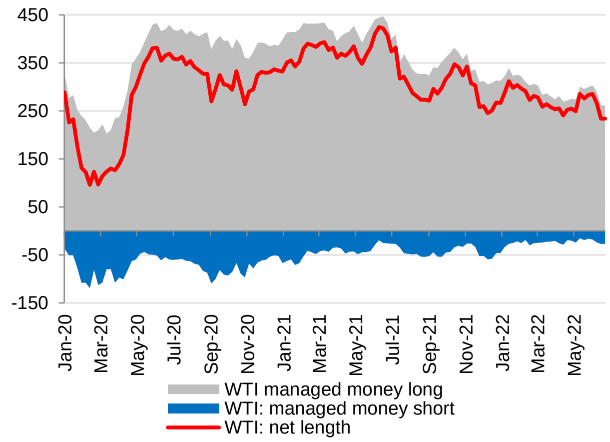
## BRENT CRUDE MANAGED MONEY

CONTRACTS (THOUSANDS)



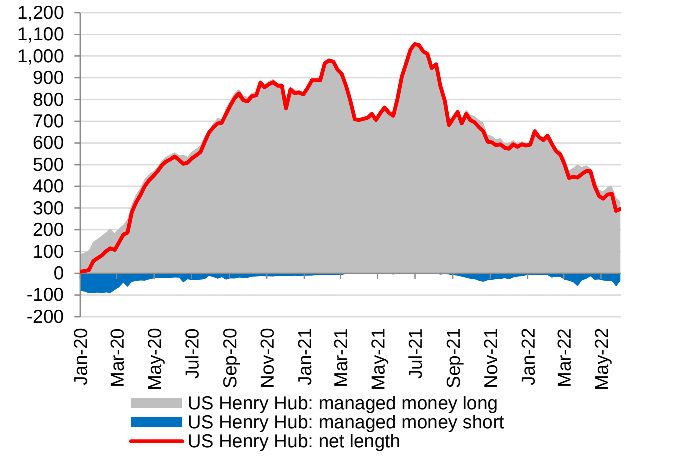

## WTI CRUDE MANAGED MONEY

CONTRACTS (THOUSANDS)



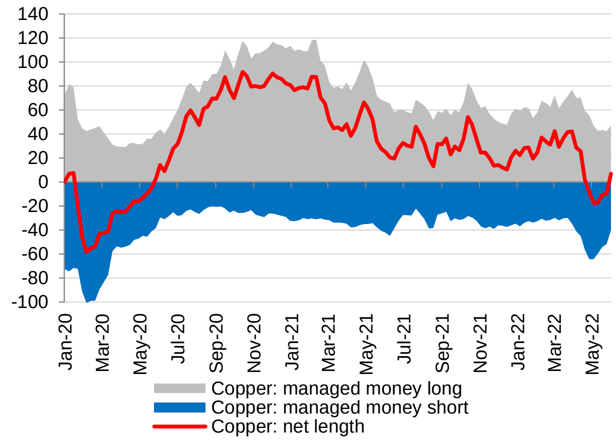

## HENRY HUB NATURAL GAS MANAGED MONEY

CONTRACTS (THOUSANDS)



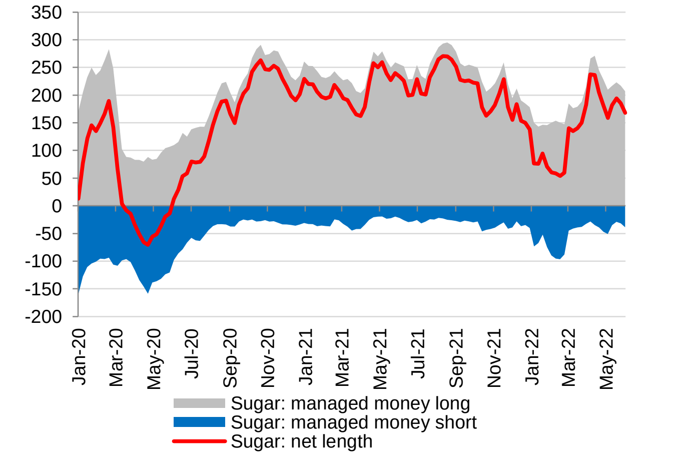

## COPPER MANAGED MONEY

CONTRACTS (THOUSANDS)



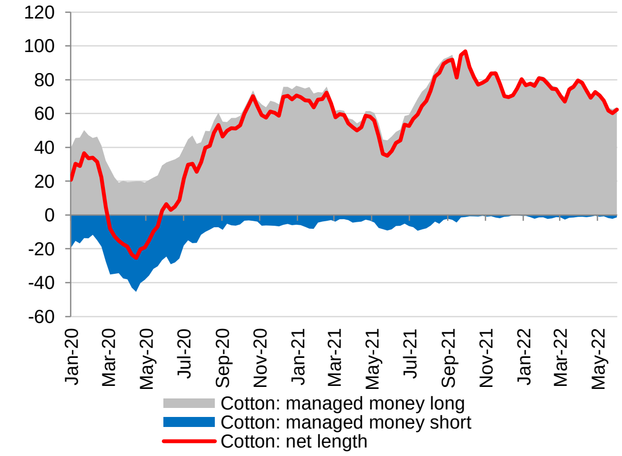

## SUGAR MANAGED MONEY

CONTRACTS (THOUSANDS)




## COTTON MANAGED MONEY

CONTRACTS (THOUSANDS)

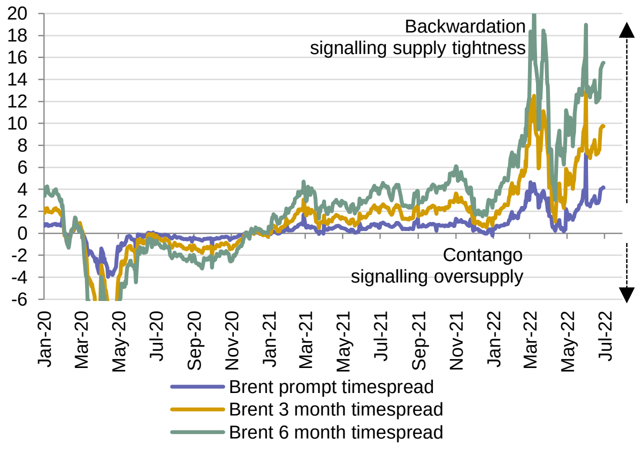



*Source: Bloomberg, EIA, IEA, OPEC, MUFG Research*

# Core indicators – timespreads and futures

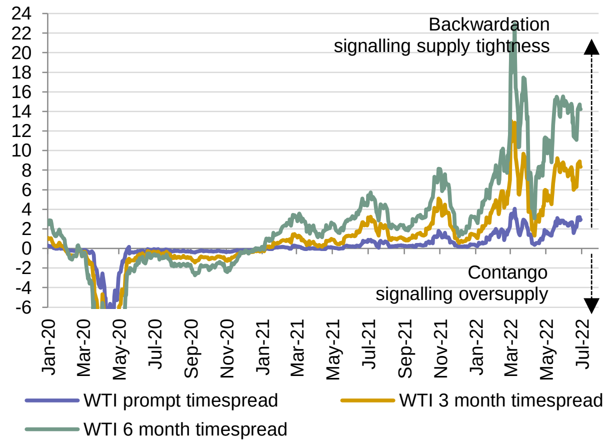
## BRENT TIMESPREADS – FRONT, 3 AND 6 MONTHS

USD/B



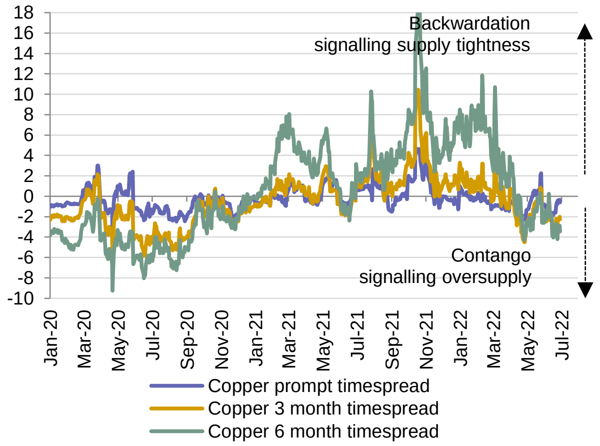

## WTI TIMESPREADS – FRONT, 3 AND 6 MONTHS

USD/B



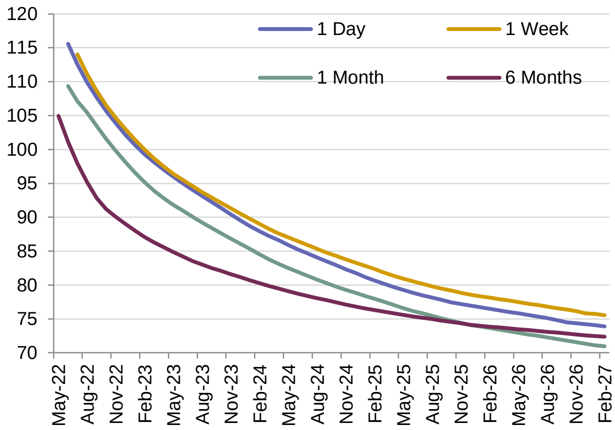

## COPPER TIMESPREADS – FRONT, 3 AND 6 MONTHS

USD/B



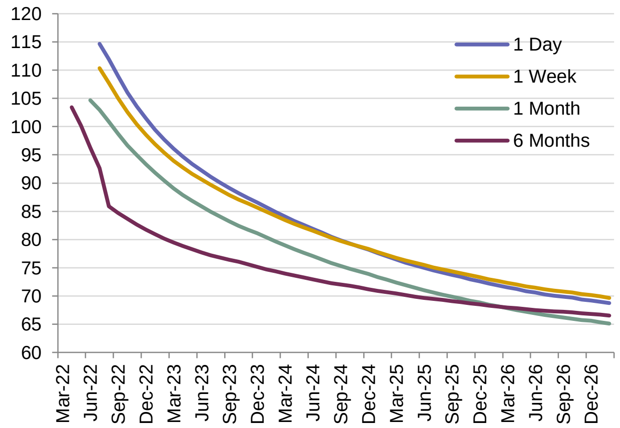

## BRENT FUTURES CURVE

USD/B



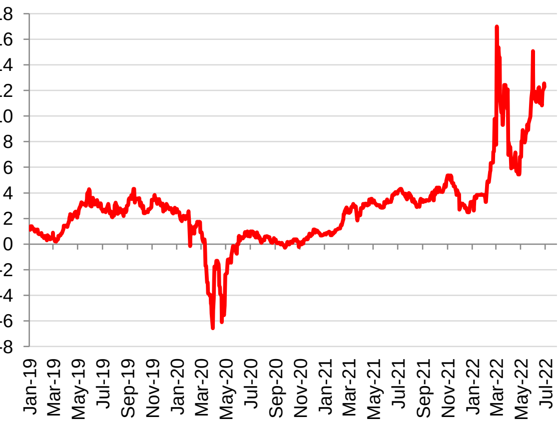

## WTI FUTURES CURVE

USD/B




## BRENT-DUBAI SPREAD

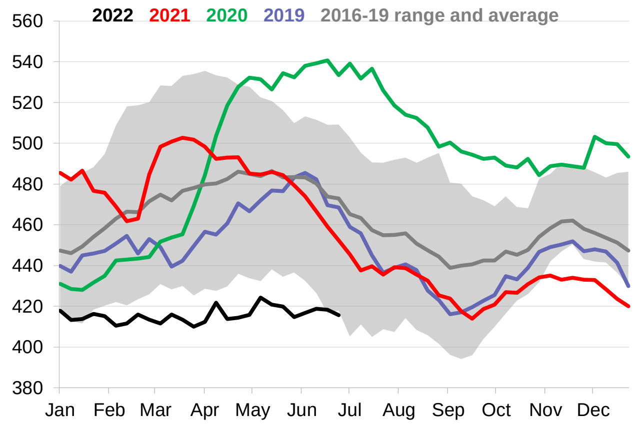
USD/B



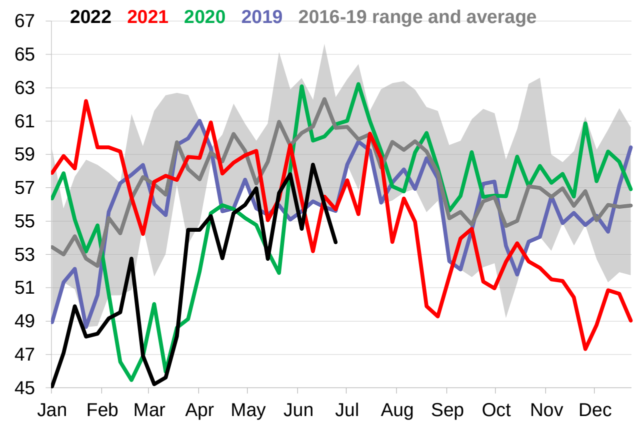
*Source: Bloomberg, EIA, IEA, OPEC, MUFG Research*

## Core indicators – inventories, storage and products

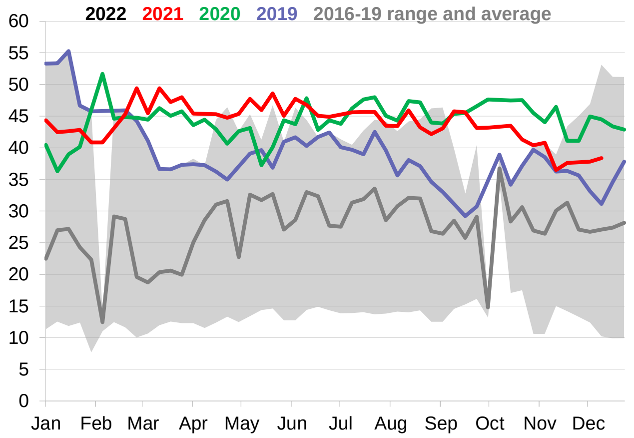
### US CRUDE INVENTORIES
MILLION BARRELS



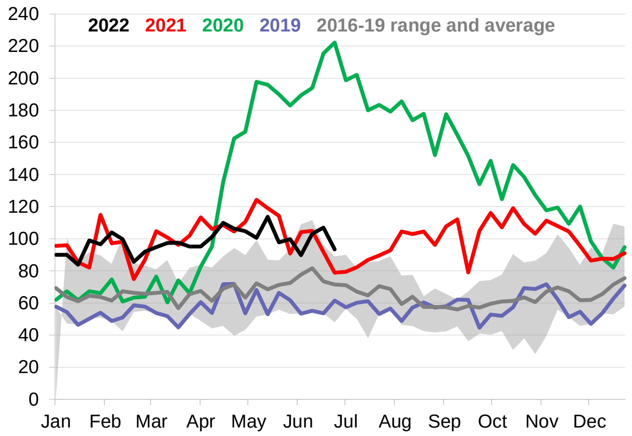

### ARA CRUDE INVENTORIES
MILLION BARRELS



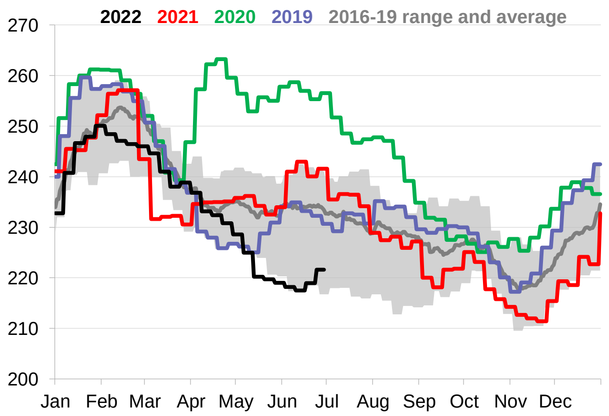

### CHINA SHANDONG CRUDE INVENTORIES
MILLION BARRELS




### GLOBAL CRUDE FLOATING STORAGE
MILLION BARRELS

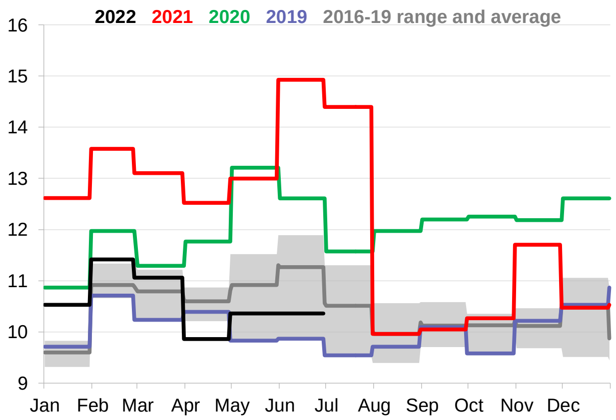



### US GASOLINE INVENTORIES
MILLION BARRELS




*Source: Bloomberg, EIA, IEA, OPEC, MUFG Research*

### JAPAN GASOLINE INVENTORIES
MILLION BARRELS



# Global oil supply/demand balance (thousands b/d and y/y change)

| As of June 2022 | 2019 (tho. b/d) | 2020 (tho. b/d) | 2021 (tho. b/d) | 2022 (tho. b/d) | 2023 (tho. b/d) | 2020 (%) | 2021 (%) | 2022 (%) | 2023 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Demand | | | | | | | | | |
| *North America* | *25,245* | *22,124* | *23,777* | *24,703* | *24,955* | *-3,122* | *1,654* | *926* | *252* |
| *LatAm* | *6,654* | *6,275* | *6,578* | *6,732* | *6,855* | *-379* | *304* | *154* | *123* |
| *Europe* | *15,093* | *13,147* | *13,772* | *14,591* | *14,707* | *-1,945* | *625* | *819* | *116* |
| *CIS* | *4,722* | *4,417* | *4,724* | *4,948* | *5,007* | *-305* | *306* | *224* | *59* |
| *Asia* | *27,931* | *27,382* | *28,708* | *29,627* | *30,751* | *-549* | *1,326* | *919* | *1,124* |
| *Middle East* | *8,241* | *7,745* | *7,922* | *8,176* | *8,223* | *-496* | *177* | *254* | *47* |
| *Africa* | *4,251* | *4,129* | *4,324* | *4,429* | *4,623* | *-122* | *195* | *105* | *194* |
| Total OECD Demand | 47,854 | 42,029 | 44,559 | 46,415 | 46,910 | -5,825 | 2,530 | 1,856 | 494 |
| Total Non-OECD Demand | 52,218 | 50,332 | 52,647 | 54,343 | 55,900 | -1,887 | 2,315 | 1,697 | 1,557 |
| Total Global Demand | 100,072 | 92,361 | 97,206 | 100,759 | 102,810 | -7,711 | 4,845 | 3,553 | 2,051 |
| Supply | | | | | | | | | |
| *North America* | *25,767* | *24,752* | *25,205* | *26,666* | *27,744* | *-1,014* | *453* | *1,461* | *1,078* |
| *US shale* | *9,923* | *9,194* | *9,009* | *9,748* | *10,550* | *-729* | *-187* | *741* | *801* |
| *Other US* | *8,306* | *8,276* | *8,619* | *9,153* | *9,344* | *-30* | *343* | *534* | *191* |
| *Total US* | *18,229* | *17,470* | *17,627* | *18,902* | *19,894* | *-759* | *157* | *1,275* | *992* |
| *LatAm* | *4,794* | *4,841* | *4,831* | *5,116* | *5,279* | *47* | *-10* | *285* | *163* |
| *Europe* | *3,477* | *3,685* | *3,527* | *3,632* | *3,757* | *208* | *-158* | *105* | *125* |
| *CIS* | *14,643* | *13,504* | *13,763* | *14,481* | *14,778* | *-1,139* | *259* | *718* | *296* |
| *Asia* | *7,694* | *7,510* | *7,437* | *7,391* | *7,234* | *-184* | *-74* | *-45* | *-157* |
| *Middle East* | *3,012* | *3,013* | *3,089* | *3,187* | *3,202* | *1* | *75* | *99* | *15* |
| *Africa* | *1,487* | *1,390* | *1,309* | *1,293* | *1,257* | *-97* | *-81* | *-16* | *-37* |
| Total Non-OPEC | 65,004 | 62,530 | 63,128 | 66,043 | 67,655 | -2,474 | 598 | 2,915 | 1,612 |
| Total OPEC Crude | 30,166 | 26,340 | 27,089 | 29,697 | 30,452 | -3,826 | 748 | 2,609 | 755 |
| Total OPEC NGL | 5,234 | 4,978 | 5,126 | 5,353 | 5,431 | -256 | 148 | 228 | 78 |
| Total OPEC Supply | 35,400 | 31,318 | 32,214 | 35,050 | 35,883 | -4,081 | 896 | 2,836 | 832 |
| Total OPEC+ Supply | 46,105 | 41,049 | 42,039 | 45,415 | 46,435 | -5,056 | 990 | 3,376 | 1,020 |
| *Ecuador* | *531* | *479* | *494* | *459* | *437* | *-52* | *14* | *-34* | *-22* |
| *Venezuela* | *875* | *508* | *555* | *803* | *830* | *-367* | *47* | *248* | *28* |
| *Algeria* | *1,023* | *898* | *908* | *939* | *935* | *-125* | *10* | *31* | *-5* |
| *Congo* | *333* | *288* | *265* | *253* | *232* | *-44* | *-23* | *-12* | *-21* |
| *Gabon* | *213* | *189* | *184* | *184* | *180* | *-24* | *-5* | *0* | *-3* |
| *Angola* | *1,389* | *1,262* | *1,116* | *1,014* | *959* | *-127* | *-146* | *-102* | *-55* |
| *Nigeria* | *1,731* | *1,577* | *1,391* | *1,502* | *1,552* | *-154* | *-185* | *111* | *50* |
| *Eq. Guinea* | *110* | *113* | *101* | *100* | *94* | *3* | *-12* | *-1* | *-6* |
| *Libya* | *1,086* | *366* | *1,151* | *1,154* | *1,266* | *-720* | *785* | *4* | *112* |
| *Iran* | *2,362* | *2,157* | *2,683* | *2,700* | *2,883* | *-205* | *527* | *17* | *183* |
| *Iraq* | *4,712* | *4,044* | *4,026* | *4,427* | *4,514* | *-668* | *-17* | *401* | *87* |
| *Kuwait* | *2,682* | *2,437* | *2,414* | *,669* | *2,713* | *-245* | *-23* | *255* | *44* |
| *Saudi Arabia* | *9,944* | *9,184* | *9,083* | *10,420* | *10,596* | *-760* | *-101* | *1,336* | *176* |
| *UAE* | *3,177* | *2,840* | *2,717* | *3,073* | *3,260* | *-336* | *-124* | *356* | *187* |
| Total Global Supply | 100,404 | 93,848 | 95,342 | 101,093 | 103,538 | -6,555 | 1,494 | 5,751 | 2,445 |
| Imbalance (Supply – Demand) | 332 | 1,488 | -1,863 | 335 | 729 | --- | --- | --- | --- |
| OECD Commercial Stocks | 65 | 377 | -1,084 | 47 | 389 | --- | --- | --- | --- |
| 5yr Avg OECD Days of Demand | 61.5 | 62.3 | 63.0 | 63.0 | 63.0 | --- | --- | --- | --- |

*Source: Bloomberg, BP, EIA, IEA, GS, JODI, NBS, OPEC, Various Government Sources, MUFG Research*

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