2023 Commodities Outlook

November 2022

Commodities 2023: Stormy seas ahead

2022 has been an extraordinary year for commodity markets. Supply risks led to increased volatility and elevated prices. However, demand concerns have taken the driving seat as we approach year-end. 2023 is set to be yet another year of uncertainty, with plenty of volatility

Russia's devastating invasion of Ukraine has been a key driver for commodity prices this year. Russia's willingness to use energy as a weapon and retaliatory sanctions on Russia from the West have had an impact not just on the commodities complex, but the broader global economy. As a result, what started out as concern over supply has now moved more towards growing demand risks as central banks around the world tighten monetary policy in a bid to rein in rampant inflation. Clearly, the longer and more restrictive policy is from central banks, the more downside there is to demand.

In addition, whilst much of the world has finally moved on from Covid, key commodity consumer, China, continues to follow a zero-Covid policy. While the government eased quarantine restrictions in recent months, China is facing its largest outbreak of Covid since the start of the pandemic, which clearly does not help the demand picture. In addition to the impact of Covid restrictions, the metal-intensive property market in China remains very weak. Up until now, support from the government has had little impact. It is yet to be seen how helpful the latest measures from the government will be.

We will be entering 2023 with markets trying to gauge the demand impact from slowing global growth. It is clear that a number of key economies will enter recession, the big question is how severe. When you couple these concerns with the ongoing weakness in China it is likely that demand will continue to dictate price direction through the early part of 2023. A turning point for the complex would likely be when we see the US Federal Reserve pivoting towards a more accommodative policy (which would also suggest we have seen the peak in the US dollar), but for that to happen, we need to see some clear evidence of a significant fall in inflation.

While demand risks are in the driving seat for now, supply risks have certainly not disappeared. In fact, these risks are growing for 2023, particularly when it comes to energy.

For oil, the global market will need to see a further change in trade flows as the EU ban on Russian crude oil and refined products comes into force. While other buyers will be keen to pick up discounted Russian oil, their ability to do so is likely limited, which suggests that we see Russian oil supply falling over the course of 2023. This coupled with OPEC+ supply cuts suggest a tighter oil market. Therefore, prices should strengthen over the course of the year.

The European natural gas market has seen a massive amount of disruption this year, as Russia cut off the bulk of supply to the region, leading to significant volatility and record-high prices. Demand destruction along with increased LNG imports have helped offset Russian supply losses. For 2023, the EU will likely find it much more difficult to refill storage to adequate levels ahead of the 2023/24 winter. Russian supply losses will be more pronounced and there are limits to how much more LNG Europe can import. Therefore, we will need to see continued demand destruction through 2023. In order to see this demand destruction, prices will have to remain at elevated levels. Tightness in the market also means that volatility is not going to disappear anytime soon.

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Metal balances are looking more comfortable for 2023. Supply growth and demand weakness should ensure this. These more comfortable supply and demand balances along with poor sentiment suggest that most metal prices will remain under pressure in the early part of 2023. We are more constructive as the year progresses though on the back of low inventories for a number of metals, expectations that we start to see monetary loosening and a modest recovery from China. Furthermore, there are still clear supply risks for a number of base metals. Up until now, Russian metals have avoided sanctions but clearly, there is always the risk that these are targeted at a later stage. As for gold, the outlook is fairly constructive. We believe that as soon as we see any signs from the US Federal Reserve of a pivot, that this will provide solid support to prices.

Agricultural commodities have also seen significant strength this year, particularly grains, due to the disruption in Ukrainian exports along with poorer weather in a number of key growing regions. These markets are going to remain sensitive to developments in the Russia/Ukraine war. However for now, we believe risks are skewed to the upside. There are some early signs that the winter wheat crop in some key growing regions will be smaller next season, whilst clearly for agri crops in general, yields could suffer due to less application of fertilisers, given the strength in the market this year.

Overall, we believe in the short term that there is further downside for commodity markets. However, as we move towards the middle of the year, and once the worst of the demand worries are behind us, supply concerns are likely to take centre stage once again, which should push prices higher.

Europe faces stiff competition for natural gas

The collapse in European natural gas prices in recent months has created a false sense of security. While the current winter appears to be more manageable, the region will find it more difficult to build adequate storage for the 2023/24 winter. We see higher prices next year

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European storage is full

Given the circumstances, Europe could not have hoped for a better situation heading into this winter. Demand destruction and milder-than-usual weather in the early part of the heating season have ensured that the region has continued to build storage deeper into winter – about two weeks longer compared to the five-year average. EU storage continued to grow until mid-November with it reaching nearly 96% full. This is well above the five-year average of almost 88% for mid-November. Given the bloated storage, day ahead TTF prices have fallen as much as 93% from the peak in August. This leaves Europe in a better-than-expected position for this winter. The next few months should be more manageable. However, it is still vital that the region is cautious through this winter, as Europe needs to try to end the current heating season with storage as high as possible given the expectation of a further reduction in gas flows to the region next year.

European demand has responded to higher prices

Higher prices through much of this year have ensured a significant amount of demand destruction, and as a result the European Commission has been able to stick to its voluntary demand cut of 15% between August and the end of March, rather than imposing a mandatory 15% cut. Eurostat data shows that in August, EU natural gas demand was 15% below the five-year average, hitting the target set by the Commission. Numbers from third-party consultants suggest that in the months since, demand reductions have exceeded the 15% target. However, the risk is that with the more recent weakness in prices, we see demand starting to edge higher once again, which would only add to the tough task that the EU faces next year.

Europe will need to see continued demand destruction through 2023 to ensure adequate supply for the 2023/24 winter. This is particularly the case given the risk that we see further declines in Russian gas supply to the EU.

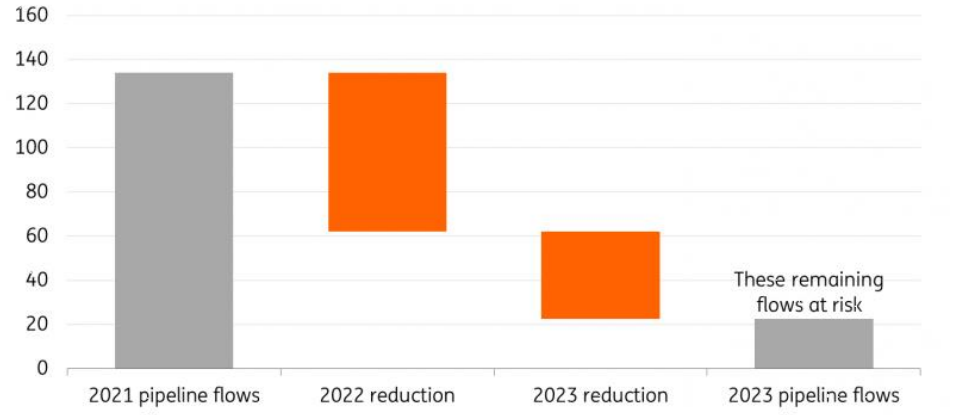
Russian natural gas flows remain a risk

Russian pipeline gas flows have fallen significantly this year. The latest data shows that year-to-date pipeline flows from Russia to Europe have fallen by around 50% year-on-year to roughly 58bcm. And, obviously, these flows have declined progressively as we have moved through the year with reduced flows via Ukraine and Nord Stream. Daily Russian gas flows to the EU are down around 80% YoY at the moment. Therefore, if we assume that Russian gas flows remain at current levels through 2023 (via Ukraine and

TurkStream only), annual Russian pipeline gas to the EU could fall by a further 60% YoY to around 23bcm in 2023. And clearly, there is a very real risk that the remaining flows via Ukraine and TurkStream are halted.

In the current environment it is difficult to see a recovery in Russian pipeline flows to Europe. Even if there was the will of both Russia and the EU to restore flows, operationally it would be difficult to see flows return to pre-war levels given the damage to Nord Stream 1. The only route where we could see a return of flows is the 33bcm Yamal-Europe pipeline and increased flows through Ukraine. However, for now, we are assuming no improvement in supply, if anything risks are likely skewed to more supply disruptions.

Russian pipeline flows to the EU (bcm)



Source: ENTSO-G, European Commission, ING Research

Limited LNG supply growth

The liquefied natural gas (LNG) market has helped Europe significantly this year. LNG imports into the EU over October grew by almost 70% YoY, with volumes exceeding 9bcm.

However, there are constraints to how much more LNG Europe can import. There are reports that LNG carriers are queuing for spots at regasification units. This highlights the lack of regas capacity in Europe at the moment. This queue of LNG carriers could also be partly due to market players wanting to take advantage of the significant contango in the front end of the TTF curve.

The EU has seen the start-up of a fair amount of regasification capacity in the form of floating storage regasification units (FSRUs) over the second half of this year. The Netherlands, Germany, Finland/Estonia have or are in the process of starting up operations at these FSRUs with a combined capacity in the region of 23-27bcm. Germany is expected to bring a further 15bcm of regas capacity online early next year. This will help with some of the infrastructure constraints Europe is facing, but the issue is also around global LNG supply and the limited capacity which is expected to start next year.

Global LNG export capacity was set to grow by around 19bcm in 2023, driven by the US, Russia and Mauritania. However, following Russia's invasion of Ukraine and the sanctions which have followed, it is likely that the start-up of Russian capacity is likely to be delayed. Russian capacity makes up for 46% of the total new capacity expected next year. Therefore, we could see just 10.5bcm of new supply capacity.

The other issue for the EU is competition for LNG. This year, weak Chinese LNG demand has been a blessing for Europe. LNG imports from the world's largest buyer were down 22% YoY over the first 10 months of the year. This would have been due to the higher

price environment as well as the demand impact from Covid-related lockdowns throughout the year. However, if we see a recovery in Chinese demand next year, Europe will have to compete more aggressively for supply.

2023 will be tight for Europe

The pace of inventory builds during the 2023 injection season will be much more modest compared to what we have seen this year, given the reductions in Russian supply. The ability of the EU to completely turn to other sources is just not possible. Therefore, Europe is likely to go into the 2023/24 winter with tight storage, which will leave the region vulnerable next winter.

In order to get through the 2023/24 winter comfortably, we will have to see continued demand destruction once again. This will have to be either a result of market forces (prices needing to trade higher to reduce demand) or EU-mandated demand cuts (the 15% voluntary demand cut at the moment ends in March 2023). While Europe should be able to scrape through the 2023/24 winter if current Russian gas flows continue, it is much more challenging if remaining Russian gas flows come to a full stop.

Therefore, we believe that there is an upside to current 2023 forward values, particularly those towards the end of 2023. Although much will depend on how much storage the EU draws down this winter, which obviously will depend on heating demand through the peak of winter.

EU intervention will not solve the underlying issues

EU member countries have been working on policies to try to soften the hit from higher natural gas prices. These include joint gas purchases, temporarily capping the TTF natural gas benchmark, and the setting up of a new LNG benchmark, which the Commission believes will be a better reflection of actual prices.

However, how effective these measures will be is still questionable. Capping the TTF benchmark increases the risk that we see more of the trade moving to the over-the-counter market, which will be excluded from the cap. This in turn would reduce liquidity on European natural gas exchanges and also reduce transparency in these markets. It appears as though the Commission will set this cap well above the market, which suggests that they only want to cap prices in an extreme situation, where high prices (similar to levels seen in August) are sustained. Furthermore, the longer-term goal of setting up a new benchmark is not going to solve the issue of bottlenecks in European gas infrastructure. TTF is trading at a premium to LNG prices because of the bottlenecks in LNG regasification capacity and pipeline infrastructure. At the end of the day, the only viable long-term solution for Europe is increasing supply and removing some of the bottlenecks facing the industry.

US natural gas market more comfortable

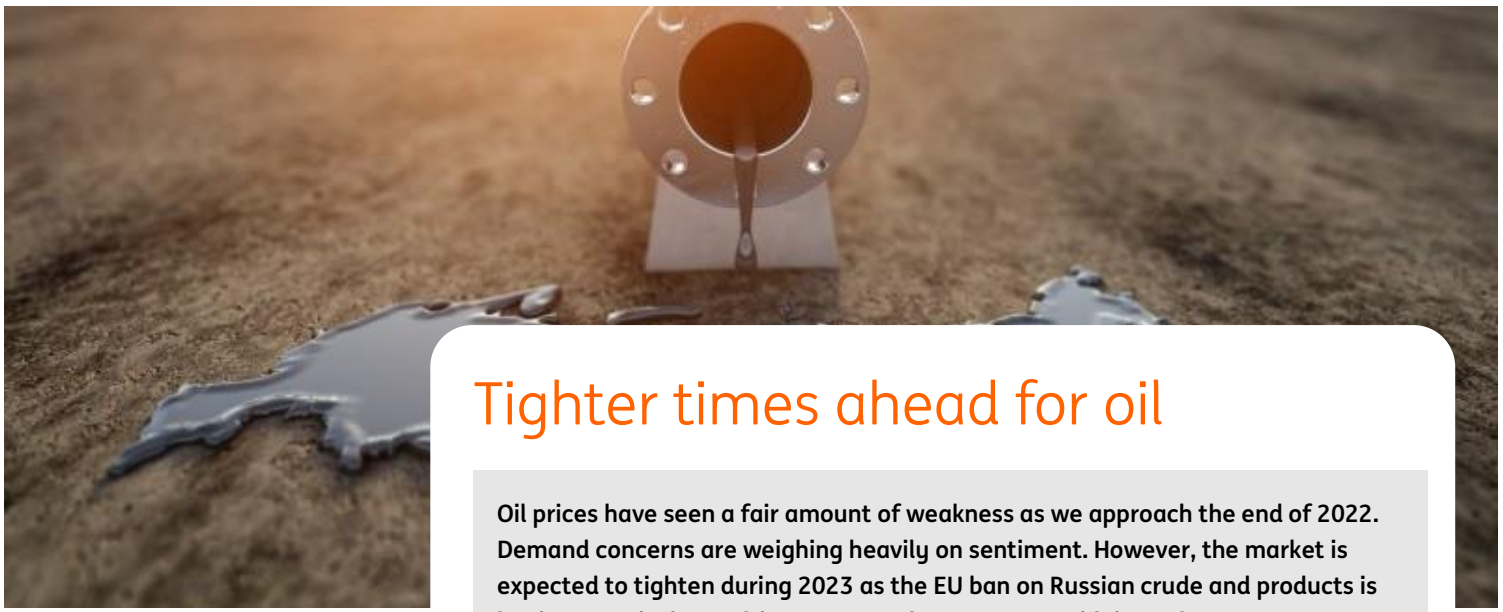
The US natural gas market this year has also seen significant strength, trading to multi-year highs. Strong global LNG prices, stronger demand from the power sector and below-average inventories have all proved bullish for Henry Hub. However, the outlook for US gas prices is more bearish. US dry gas production is expected to hit record levels next year, growing by a little more than 1.6bcf/d to average almost 99.7bcf/day over 2023, whilst finishing 2023 with output in excess of 100bcf/day. In addition, this year saw stronger demand from the power sector over the summer, which pushed overall gas demand higher this year. Expectations are that domestic demand will fall back towards more normal levels. Meanwhile, on the export side, whilst there is more LNG capacity set to start up over the course of the year, this is fairly limited. LNG exports are expected to average a little over 12.3bcf/day in 2023, up from an estimated 10.8bcf/day in 2022.

As a result, over the course of 2023, we should see US natural gas inventories moving from below their five-year average to above it ahead of the next heating season. In fact, the US could go into the 2023/24 winter with storage at its highest levels since 2020. Therefore, we expect Henry Hub to trade lower in 2023 relative to 2022.

ING natural gas price forecasts

	1Q23	2Q23	3Q23	4Q23	FY23
TTF (EUR/MWh)	150	140	190	220	175
NBP (GBp/therm)	265	245	330	380	305
Henry Hub (US$/MMBtu)	6.5	5.0	4.3	4.7	5.1

Source: ING research



Tighter times ahead for oil

Oil prices have seen a fair amount of weakness as we approach the end of 2022. Demand concerns are weighing heavily on sentiment. However, the market is expected to tighten during 2023 as the EU ban on Russian crude and products is implemented, along with OPEC+ supply cuts. We see higher prices next year

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Russian supply set to fall

The key supply uncertainty for the oil market this year has been how well Russian supply would hold up following a number of countries banning Russian oil, along with an increased amount of self-sanctioning. Russian supply has held up better than many were expecting, with India, China and a handful of other smaller buyers increasing their purchases of Russian crude oil, given the steep discounts available as other buyers have pulled back. As a result, exports in October were 7.7MMbbls/d, down just 100Mbbls/d year-on-year.

However, the biggest disruption to the crude oil market still lies ahead of us. The EU ban on Russian seaborne crude oil comes into effect on 5 December, which will be followed by a refined products ban on 5 February. The key question is whether India and China can buy even larger volumes of Russian oil. Their ability to do so is likely limited. Russia has already become India's largest supplier, making up around 20% of total supply, and since the war, Russian barrels make up a little more than 18% of total Chinese imports, making Russia a marginally larger supplier of crude to China than Saudi Arabia. We expect that Russian supply will have to fall once the ban comes into full force and are assuming that supply in the first quarter of 2023 declines in the region of 1.6-1.8MMbbls/d YoY. The other uncertainty around Russian supply is the full impact of the G7 price cap. While the aim of the cap is to ensure Russian oil flows continue but Russian oil revenues are limited, it is still yet to be seen if Russia responds by lowering output. On several occasions, Russia has threatened to cut the supply of crude oil or refined products to any country that follows the G7 price cap.

How the Russia/Ukraine war evolves will be important for oil markets in 2023. While a de-escalation might not lead to the return of pre-war oil trade flows, it would remove a lot of supply risk from the market.

OPEC+ sticks to its guns

OPEC+ has clearly not read the book How to win friends and influence people. The group has largely ignored calls from the US and other key consumers to increase oil supply more aggressively this year amid higher prices and supply concerns. And the group's decision to reduce output targets by 2MMbbls/d from November 2022 until the end of 2023 has been criticised, particularly by the US. Although, to be fair, with hindsight the decision by OPEC+ appears to be the right one, at least in the near term with it offering stability to the market. Given that the bulk of members are producing well below their production targets, OPEC+ supply cuts work out to an effective cut of around

1.1MMbbls/d. In aggregate, OPEC+ production was 3.22MMbbls/d below target levels in October 2022.

However, the cuts may prove to be more destabilising in the medium term, given the expectation of a tighter market through 2023. In addition, we should not rule out the potential for OPEC+ to change policy over the coming months. Intensifying demand concerns could push the group to cut supply further, while significant Russian losses could see a relaxation in cuts. However, to see an easing in cuts, the group would want full clarity on the impact of the ban on Russian oil.

Could Iran and Venezuela make a comeback?

US sanctions have prevented Iran and Venezuela from fully benefitting from the higher price environment this year. Iranian nuclear talks have failed multiple times over the last year, and it is looking increasingly unlikely that we will see US sanctions lifted anytime soon, particularly given Iranian developments both internally and externally. If sanctions were lifted, Iran could increase supply by around 1.3MMbbls/d over time. However, we are assuming that the Iranian supply remains at current levels through 2023.

The potential additional supply from Venezuela is more limited (relative to Iran) if the US were to lift sanctions. However, the likelihood of an easing in these sanctions is probably higher at the moment. We have recently seen some softening in these sanctions already. An easing in sanctions would mean that US Gulf refiners would be able to process the heavy crude that Venezuela produces and replace a large amount of Russian residual fuel that was processed prior to the US-Russian oil ban. The potential for higher Venezuelan supply does not change the global balance significantly.

US not there to fill the gap

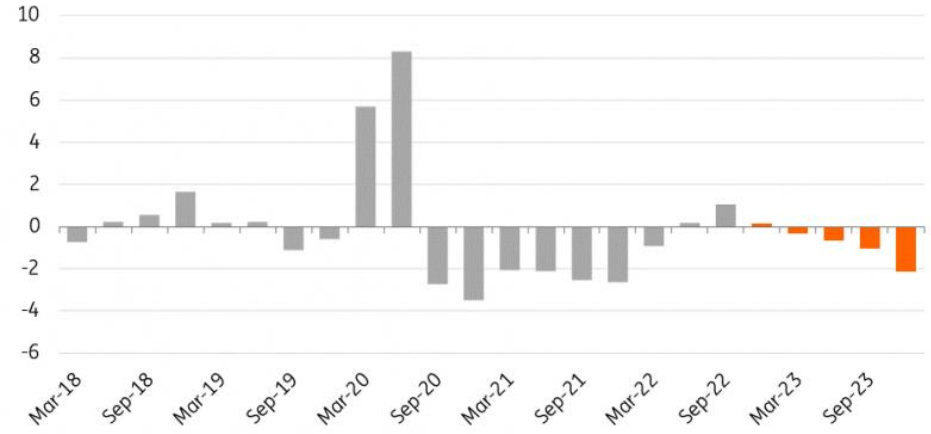
The response from US producers to the higher price environment this year has been anything but impressive. And this appears to have also given OPEC+ confidence to cut supply without the risk of losing market share. US crude oil supply is forecast to grow by less than 600Mbbls/d to average around 11.8MMbbls/d in 2022. While for 2023 supply is forecast to grow by less than 500Mbbls/d to around 12.3MMbbls/d. This growth is much more modest than the supply growth seen in previous upcycles. For example, in 2018 US crude oil output grew by around 1.6MMbbls/d YoY, after WTI traded from US$42/bbl in June 2017 to as high as US$76/bbl in October 2018. This year, WTI has averaged a little over US$95/bbl, whilst the forward curve has been trading above US$70/bbl all the way through to the end of 2024 for much of the year.

The mentality of US producers has changed significantly from producing as much as possible to focusing on shareholder returns, and as a result continuing to show discipline when it comes to capital spending. In addition to showing more restraint with capital spending, supply chain issues, labour shortages and rising costs have also played a role in the more modest supply growth expected over the next year.

Demand weaker than expected

A key drag on the oil market more recently has been the demand picture. High energy prices, a gloomier macro outlook and China's zero-Covid policy have all weighed on oil demand this year. At the beginning of 2022, global oil demand was expected to grow by more than 3MMbbls/d YoY and hit pre-Covid levels. However, demand is estimated to grow at a more modest 2MMbbls/d this year, leaving it below pre-Covid levels. While for 2023, demand is expected to grow in the region of 1.7MMbbls/d. Almost 50% of this growth is expected to come from China with the expectation of an economic recovery. Clearly, this is a risk if China's zero-Covid policy proves to be as disruptive as it has been this year.

Global oil balance (MMbbls/d)



Source: IEA, EIA, OPEC, ING Research

Tighter market in 2023

A combination of lower Russian oil supply and OPEC+ supply cuts means that the global oil market is expected to tighten over 2023. We expect a growing deficit over the course of the year, which suggests that oil prices should trade higher from current levels. We currently forecast ICE Brent to average US$104/bbl over 2023. Clearly, demand is a risk to this view, while if we were to see a de-escalation in the Russia-Ukraine war, a large supply risk would disappear even though we are unlikely to see a return to pre-war oil trade flows. Meanwhile, the potential for the US to refill its strategic petroleum reserves should WTI fall towards US$70/bbl is likely to provide a strong floor to the market.

ING oil price forecasts

	1Q23	2Q23	3Q23	4Q23	FY23
ICE Brent (US$/bbl)	100	100	105	110	104
NYMEX WTI (US$/bbl)	96	97	102	107	101

Source: ING Research

Middle distillates tightness to persist

Middle distillates have been a standout among refined products. Inventories are tight in all regions and there is plenty of uncertainty over Russian flows when the EU ban comes into effect next year. While we expect middle distillate cracks to come off from the highs this year, the market is likely to still trade at elevated levels on a historical basis

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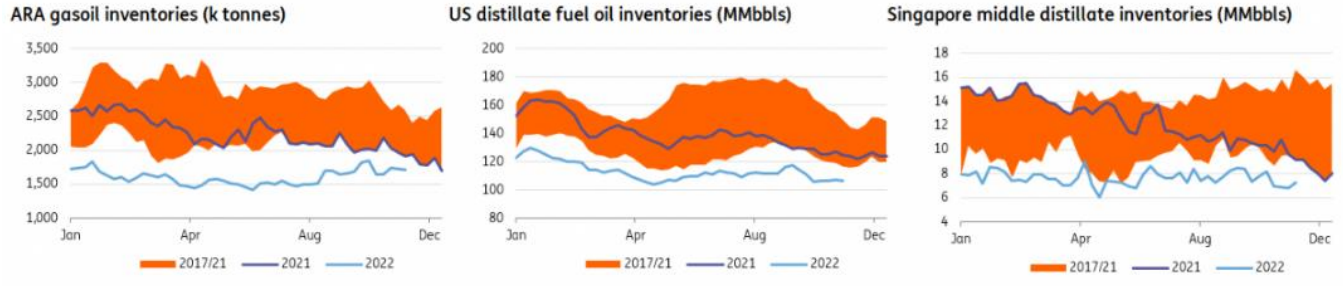
Low middle distillate inventories

Middle distillate inventories are tight around the globe. In the US, distillate fuel oil stocks are at their lowest levels on record for this time of year. And the tightness is even more extreme on the US East Coast. In Europe and specifically the ARA region, gasoil stocks are at their lowest levels since 2008 for this stage of the year, according to Insights Global. In Singapore, middle distillate stocks are down at levels last seen back in 2004 for this time of year.

The tightness in the market has led to governments in Europe tapping into emergency diesel stockpiles in a bid to ease the tightness. Emergency inventories have fallen from more than 41m tonnes back in January 2021 to less than 36m tonnes by the end of August. In the US, there have been calls for the release of diesel from the Northeast Home Heating Oil Reserve although these reserves are fairly modest at just 1MMbbls.

The US administration is concerned about tight inventories and high prices. As a result, options are being looked at to try to ease price pressures. These options include mandating producers to hold a minimum amount of fuel inventories, increasing the Northeast Home Heating Oil Reserve, and possibly limiting fuel exports. However, any step to limit fuel exports would have to be done in combination with a relaxation of the Jones Act which would make it easier to ship product from the US Gulf Coast to the US East Coast. Furthermore, increasing the size of the Northeast Home Heating Oil Reserve in the short term would only add more pressure given that this product would need to be bought from the market.

Middle distillate inventories by region



Source: EIA, Insights Global, International Enterprise Singapore, ING Research

What is driving this tightness and will it persist?

There are multiple factors which have driven the tightness in the middle distillate market, and whilst some of the issues will likely intensify, some will ease. On balance, middle distillates are likely to remain relatively well supported.

Russia/Ukraine war - Russia is a large supplier of middle distillates and a significant portion of this goes into Europe. Prior to the war, Russia was exporting in the region of 1MMbbls/d of gasoil - almost 40% of total Russian refined product exports. While current sanctions and self-sanctioning have affected Russian flows already, the key disruption to these flows will occur once the EU ban on Russian refined products comes into force on 5 February 2023. This means Europe will need to find an alternative for the more than 500Mbbls/d it has been importing from Russia. And this is at a time when the global middle distillate market is already very tight.

Whether the EU ban on refined products is manageable will depend on how quickly trade flows can adjust and whether there are willing buyers of Russian gasoil further afield. If so, this would free up alternative supplies for the EU. However, the quality of product and logistics could certainly complicate the necessary shift in trade flows.

China export quotas - China has played an important role in the tightening of the refined products market. Policy has meant that the government has reduced export quotas for refined products in recent years, which has led to a sharp fall in refined product exports, including middle distillates. In 2019, Chinese exports of gasoil averaged 1.78mt per month. So far this year, Chinese gasoil exports have averaged just 554kt per month. The reduction in export quotas has been part of China's broader aims of reducing emissions and improving efficiency within the refining industry.

However, more recently this seems to have taken a back seat, with the government more concerned about trying to prop up the economy. This is evident with the government issuing 15mt of export quotas back in September. In theory, these quotas should be used by the end of 2022, however, it appears as though refiners will be able to use these quotas through until the end of the first quarter in 2023. This should provide some relief to tight middle distillate markets in Asia. Recent trade data is already showing that Chinese gasoil exports picked up significantly in September and October. The refined product markets will have to wait and see if this policy change from China is a complete U-turn or whether in the medium to longer term the aim is still to drive consolidation within the domestic refining industry.

Reduced global refining capacity - Since the start of the Covid pandemic, we have seen a significant amount of refining capacity shut. These closures have been seen in Europe, the US and APAC. This was largely due to weak refinery margins during Covid. As a result of these closures, global refining capacity saw a net decline of 730MMbbls/d in 2021, the first net decline in 30 years.

In the US, operable refining capacity has fallen by a little more than 1MMbbls/d or 5% since February 2020. These declines have been predominantly driven by PADD1 (US East Coast), where more than 400Mbbls/d refining capacity has shut - reflecting a 33% decline in capacity in the region. This reduced refining capacity helps to explain the tightness we are seeing in refined product inventories on the East Coast.

Reduced capacity has meant that it has been more difficult for refiners to respond as demand has recovered. And it is unlikely that we will see large investment in refineries in Europe and North America given the uncertain demand outlook in the longer term. As a result, the oil market will have to rely on growing capacity from elsewhere.

There is a fair amount of new refining capacity expected to ramp up over 2023. The 615Mbbls/d Al Zour refinery in Kuwait recently started the first phase of commercial

operations and will ramp up through 2023. In Nigeria, Dangote is scheduled to start up its 650Mbbls/d refinery in the middle of 2023. And in Oman, the 230Mbbls/d Duqm refinery is expected to start operations by the end of 2023. The IEA estimates that a net of 2.7MMbbls/d of new refining capacity will start up between 4Q22 and the end of 2023.

While a meaningful amount of capacity is set to start up next year, which will eventually help to offer some relief to middle distillate markets, the bulk of this new supply will only become available quite some time after the EU ban on Russian refined products comes into force.

Gas-to-oil switching - High natural gas prices through the year have led to a significant amount of demand destruction this year. This is particularly the case for industrial users in Europe and also power generators. However, where possible some have likely switched to cheaper fuels, including oil and specifically fuel oil and middle distillates.

As for what lies ahead, weaker gas prices more recently have taken some pressure off the market. However, the European natural gas market is still expected to be tight next year, which suggests the potential for continued switching to other fuels like oil.

Will there be relief in 2023?

The middle distillate market is likely to remain tight over 2023. There is plenty of uncertainty as we head towards the EU ban on Russian refined products. Clearly, this will see European buyers looking for supply elsewhere. Europe will likely have to rely more heavily on the Middle East for supplies, however, new refining capacity will take time to ramp up and so will not offer immediate relief to markets. In addition, expectations are that natural gas prices will remain elevated through 2023, which should support gas-to-oil switching. We should also not rule out the risk that the US takes action to alleviate tightness in the domestic market, which could have an impact on global middle distillate markets.

China could help the middle distillate market if the government releases sizeable export quotas for 2023. However, this is a big unknown for markets at the moment.

ING middle distillate forecasts

	1Q23	2Q23	3Q23	4Q23	FY23
ICE Gasoil (US$/t)	1,120	1,005	1,005	1,060	1,050
NYMEX Heating Oil (USc/g)	375	340	340	355	350

Source: ING research

Aluminium faces macroeconomic headwinds

Negative macro sentiment will continue to put downward pressure on aluminium, with a worsening demand outlook being balanced against tight physical supply

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Volatility reigns in 2022

Aluminium prices have been highly volatile in 2022 due to the Russia-Ukraine war, logistical issues, increasing recessionary fears and the Covid-19 pandemic.

LME prices reached a peak of $3,849/t in March but have now declined more than 40% from their post-invasion peaks.

LME prices are down more than 40% since March peak

Source: LME, ING Research

High energy costs remain a threat to supply

Soaring energy costs following Russia's invasion of Ukraine have squeezed producers' margins, with energy-intensive metals having been particularly affected. Aluminium, the most energy-intensive base metal to produce, requires about 40 times more energy to make than copper.

Several output cuts have already taken place since December 2021 at key European smelters, including Alcoa's San Ciprian smelter and Hydro's plant in Slovakia.

As of mid-October, Europe and the US combined have cut around 1.7 million tonnes of capacity – 25% of European output and 2.1% of the global total – from the second half of 2021.

Production cuts in Europe account for around 1.4 million tonnes of capacity. In the US, more than 300,000 tonnes of capacity have been cut, including Alcoa's Warrick and Century Aluminium's Hawesville plants.

Despite the recent weakness in energy prices, we do not expect capacity to come back online in the short term with Europe heading into the winter months and the war with

Russia raging on. Further smelter closures and curtailments in production are highly likely given the uncertainty over energy prices through next year. Any announcement of further closures could see aluminium prices spike but any potential rallies are likely to be unsustainable. We don't anticipate European smelters restarting before 2024.

Although production continues to be cut in Europe and in the US, global primary aluminium output in October rose 3.1% year-on-year to 5.85 million tonnes, according to data from the International Aluminium Institute (IAI). Estimated Chinese production was 3.475 million tonnes, according to the IAI.

Total worldwide production on an annualised basis came in at 68.9 Mt, according to the IAI. For Chinese production, the IAI estimated the annualised October output at 40.9 Mt.

China's aluminium smelters are facing constraints, too. In the drought-hit hydro province of Yunnan, which accounts for 11% of China's aluminium output, aluminium smelters have been required by the government to reduce their operating rates from mid-September. The smelters in Yunnan have cut around 20% of operating capacity, around 1.1 M t/y. It is unlikely that any idled capacity will resume by the end of this year due to current energy issues, with restarts forecast for 2Q 2023 once hydro-reservoir levels have stabilised.

This was the second consecutive year that Yunnan cut primary aluminium production. In 2021, smelters in Yunnan experienced three rounds of major curtailments amid power supply shortages, with cuts accounting to 1.74 M t/y of aluminium smelting capacity on an annualised base.

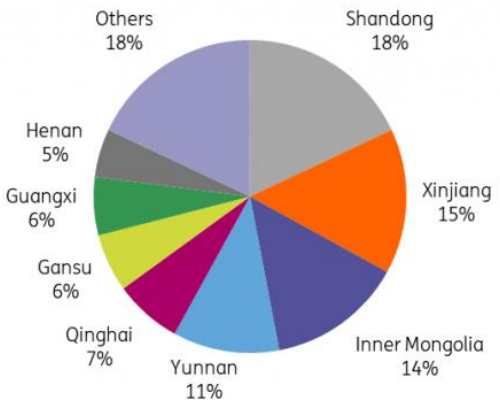
The output reductions in Yunnan came after Sichuan smelters cut 920,000 tonnes of capacity in August, accounting for 2% of China's total. Most smelters in Sichuan have now restarted the idled capacity.

More recently, some smelters in Henan province were planning to cut around 10% of their capacity due to a combination of winter season-related cuts and operational losses, which could account for an additional 50,000-100,000 t/y.

Still, China's aluminium output has held up despite the energy crunch. For the first 10 months of the year, China produced 33.33 million tonnes, up 3.3% from the corresponding period in 2021, data from the National Bureau of Statistics showed.

In the longer term, as China continues to decarbonise its aluminium industry and increases its share of power generated by green energy, and as capacity shifts from coal power-dominated Shandong province to hydro power-dominated Yunnan, the industry is vulnerable to further disruptions with green energy heavily relying on seasonality and general weather conditions.

China's aluminium capacity breakdown by province



Source: National Bureau of Statistics, ING Research

Demand woes take centre stage

The rise in global aluminium output comes against weakening demand amid global economic gloom.

The aluminium market's focus has shifted to demand woes due to European recession fears amid high power prices, central banks' monetary tightening and China's continued Covid-19 restrictions.

Industrial metals prices have been battered by fears of weakening global demand, as well as a stronger dollar. Growing recession risks in the US and Europe and an uncertain recovery in China will likely continue to pose downside risks to the demand outlook.

In its latest World Economic Outlook, the International Monetary Fund cut its forecast for global growth next year to 2.7% from 2.9% seen in July and 3.8% in January, adding that it sees a 25% probability that growth will slow to less than 2%.

About one-third of the global economy risks contracting next year, with the US, the EU and China all continuing to stall. Excluding the unprecedented slowdown of 2020 because of the coronavirus pandemic, next year's performance would be the weakest since 2009, in the wake of the global financial crisis.

Aluminium consumption has been hit by the bleak global growth outlook, with primary aluminium demand in the world excluding China expected to grow 0.4% YoY in 2022, according to CRU. No dramatic recovery is expected in 2023, as many economies will battle with recession, with demand expected to grow by just 1.8% YoY in 2023 at 28.9 Mt, according to CRU. European demand has been hit the most in 2022 and is expected to be the major reason for weak growth in 2023.

In China, demand has stalled in 2022 amid zero-Covid policies and lockdowns, with CRU expecting demand to grow just 0.1% YoY in 2022, at 40Mt, while the recovery in 2023 is expected to be sluggish given a slowdown in the construction sector.

Russian metal remains the biggest uncertainty

One potential source of price volatility would be sanctions on the Russian material either by the US or the EU. Metals have been mostly spared in the rounds of sanctions imposed on Russia that followed its invasion of Ukraine on 24 February, but it has been reported that the US is considering an effective ban on Russian imports of the metal. The Biden administration is reportedly weighing three potential measures: a complete ban on Russian aluminium, increasing tariffs to levels that would effectively act as a ban and sanctioning the company that produces Russian aluminium, Rusal.

The only government to take direct action against Russia's aluminium sector so far has been Australia, when in March it banned the export of bauxite and alumina into the country, effectively freezing Rusal's off-take flow from the Queensland Alumina joint venture. In Russia's other top raw material supplier, Ukraine, the war has closed Rusal's Nikolaev refinery. The alumina gap has been filled by Chinese producers, which have been increasing their exports to Russia.

However, if the US decides to sanction Rusal, the impact could be severe, bearing in mind the market's reaction to the sanctions in 2018 when the LME prices jumped to $2,718/t, at the time the highest since 2011 before gradually falling in the following weeks and months. Sanctions were then lifted in January 2019.

If the US decides to go ahead, the move could freeze the Russian producer out of Western markets, depending on the severity of sanctions, which would boost global prices for the metal and distort global aluminium trade flows.

Meanwhile, at least for now, the aluminium market has a bit more clarity following the LME's decision to take no action on the delivery of Russian metals into LME warehouses, as a significant portion of the market was still planning to buy it next year.

The LME was looking at potentially banning the delivery of Russian metal into its warehouses, limiting Russian flows or taking no action.

Instead, the exchange said it will publish regular reports from January 2023 detailing the percentage of Russian metal stored under warrant in LME warehouses to provide more transparency. In a response to the LME's proposal, Rusal has called for the exchange to start disclosing the origin of all metal stocks on warrant rather than singling out Russia as proposed. Alcoa was also supportive of the idea of providing more details about the origin of the material in LME warehouses.

If we continue to see an increasing amount of self-sanctioning of Russian metals, the risk is that we see more Russian metal being delivered into LME warehouses, which could potentially mean that LME prices trade at discounted levels to actual traded prices. However, the LME believes we would have seen higher inflows of metals into warehouses regardless, given the depressed global outlook.

The LME's decision to continue to allow Russian metal to be delivered into its warehouses put some downward pressure on aluminium prices, easing fears of supply shortages. How much further pressure we will see on aluminium prices going forward will depend on whether we see a significant inflow of Russian metals into LME warehouses in the weeks and months ahead.

While the LME accepts that LME prices may start to increasingly reflect the price of Russian metal if we see large inflows into LME warehouses, they believe that premia will play an important role, with this likely reflecting a larger proportion of the all-in cost, so that non-Russian metal producers continue to receive fair value for their metal.

Russia accounts for about 6% of global aluminium output estimated at 70 million tonnes this year. Russian aluminium has accounted for as much as three quarters of LME stockpiles over the past decade, according to the exchange.

The LME has reported that the proportion of Russian metal in LME warehouses has not changed significantly over the discussion paper period, with the percentage of live tonnage of Russian aluminium on warrant standing at 17.7% on 28 October, compared to 17% on 6 October when the LME launched the discussion paper.

At the same time, the flow of Russian metal into Western markets was strong in the first half of the year. European average monthly imports were up by 13% year-on-year in March through June, while the US increased its Russian imports by 21% in the same period.

Most Rusal customers have been accepting deliveries under existing contracts, however, that is likely to change next year. Self-sanctioning is likely to disrupt trade flows with the possibility of Russian metal flowing to the market of last resort – the LME. Novelis, a division of Hindalco Industries and Norsk Hydro's extrusions unit have already said they will not enter into new Russian purchase contracts for 2023.

Rusal has recently said that its sales picked up after the LME's decision, exceeding 76% of its primary aluminium production and value-added production for 2023.

Prices to slide in early 2023 on poor near-term economic outlooks

Looking ahead to 1Q 2023, the risk for aluminium prices will be mainly to the downside, with the prolonged war in Ukraine, rising energy prices, low gas availability, high inflation and weakening downstream demand all adding to the bearish outlook for the lightweight metal.

The aluminium market will significantly reduce its global deficit in 2022 and move into surplus in 2023, according to CRU, with an estimated market deficit of 300kt in 2022, down from 1.6Mt in 2021. Given the production cuts, CRU is expecting only a modest surplus next year of 300kt tonnes. This is driven by demand destruction in the world ex-China in 2022 and 2023 and a higher rate of production inside China compared to 2021.

The projected surplus in the world ex. China is only 71,000 tonnes. Demand destruction will offset the impact of smelter closures seen in recent months.

In the short-term, the market's focus will remain on the bigger macro-economic and demand-side problems, with prices expected to fall further to $2,150/t in 1Q 2023.

We believe a recovery in price should start in 2Q 2023, although any recovery is likely to be slow.

ING forecasts

	1Q23	2Q23	3Q23	4Q23	FY23
LME Aluminium (US$/t)	2,150	2,200	2,300	2,500	2,290

Source: ING research

Macro headwinds to keep pressure on copper prices

Copper has lost all of the gains it made this year as inflation has climbed higher, interest rates have risen, and energy costs keep surging. The short-term demand outlook for the red metal remains weak amid recession fears, China's slowdown and weakening global manufacturing activity

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Copper fails to hold onto gains

LME prices are now down around 30% from their peak in February following Russia's invasion of Ukraine when the three-month LME copper price reached $10,580/t. Despite copper's fundamentals looking supportive, the red metal has failed to hold onto its gains, as global slowdown fears remain elevated.

China remains the big question mark

Covid-19 lockdowns in an already-slowing Chinese economy have continued to dampen the demand outlook for the red metal with the country's property sector remaining a big question mark for the copper market looking ahead. For almost two decades, China's property sector growth and the country's rapid urbanisation have been the key driver of growth for copper demand, which represents almost a quarter of the nation's total demand.

The country's GDP grew 3.9% year-on-year in the third quarter of 2022, faster than the consensus forecast of 3.3% YoY and 0.4% YoY in the second quarter, but real estate contracted 4.2% YoY due to uncompleted projects that almost paused activities from land bidding to housing starts in the industry. However, more recently, hopes have grown that fresh stimulus measures will boost demand for the red metal after moves to shore up the country's property sector and ease Covid restrictions.

China's relaxation of its Covid-related quarantine measures reduces the quarantine period for inbound travellers and the close contacts of those who test positive. In addition, secondary contacts will no longer need to be traced. The government also said it will bolster vaccinations among senior citizens, although it stopped short of issuing mandates to help raise inoculation rates.

However, while we are seeing these changes in policy, China is also experiencing its highest numbers of daily Covid cases since April. Beijing recently saw the country's first Covid deaths in six months with the city tightening its restrictions. Guangzhou has locked down its largest district with cases continuing to soar. Reports of Covid protests in China will also likely prove harmful for general sentiment.

The latest easing in quarantine requirements is certainly a step in the right direction, but the market will likely need to see further easing if this enthusiasm is to be sustained.

China has also recently implemented 16 property measures to help the weak property sector. Some of these measures include debt extensions to the industry and relaxing deposit requirements for homebuyers. These could potentially boost the usage of

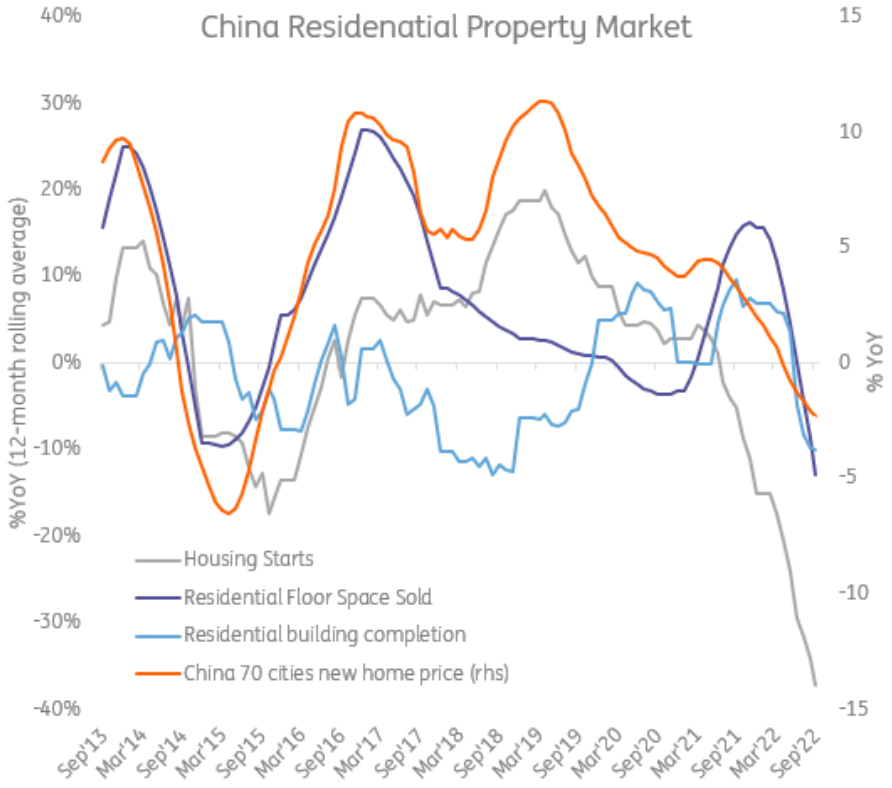
industrial metals, including copper. Around 23% of China's copper end-use comes from civil and building construction.

For now, the uncertainty surrounding Covid-19 restrictions in the country continues to take its toll on demand for the metal.

In October, imports of both metal and ore fell to their lowest in more than a year amid slowing factory activity. We believe consumption and imports of the red metal will remain muted until the end of the year with the property market and economy set to remain weak, while concerns over China's economy will continue to put pressure on copper until the government eases the country's Covid-19 restrictions further.

We believe the Chinese government is likely to stick to its Zero-Covid policy through winter and will look at easing some of the curbs further after the National People's Congress in March or April next year. Preferential policies on property developer financing could limit the further increase in uncompleted residential projects. We expect China to gradually improve but remain sluggish until 2H23 with its Zero-Covid strategy likely to remain in place until then.

China's property woes weigh heavily on copper



Source: ING Research

Caught between weakening demand and shrinking supply

On the supply side, disruptions in South America continue to be in the spotlight for copper.

Chile's mined copper production, which accounts for about a quarter of world supply, slumped by 6% in 2022 through July, according to the most recent International Copper Study Group data, due to lacklustre ore grades, labour woes and water scarcity.

Last year, Chile's production represented a 1.84% annual decrease from 5.73 million tonnes in 2020, and the lowest since 2017. The country's ore quality has also been

steadily declining. Average copper mining grades were 1.41% in 1999 but are now around 0.60%.

Codelco, the world's biggest copper producer, has lowered its guidance for the year by 100,000 tonnes to about 1.5 million tonnes.

In Peru, protests by local communities in key mining areas have also continued this year. Most recently, Las Bambas copper mine in Peru, owned by Chinese miner MMG, which accounts for 2% of the global copper supply, has started to reduce operations due to recent blockades. In August, MMG lowered its forecast for annual copper production at Las Bambas to 240,000 tonnes.

Despite the high level of disruptions, mine production continued to grow strongly in the third quarter of this year. CRU is forecasting year-on-year global growth to reach 3.2% in 2022. The ramp-up of Ivanhoe Mines' Kamoa-Kakula in the Democratic Republic of the Congo is partly responsible for the growth as well as Anglo American's newly-commissioned Quellaveco mine in Peru, which started operating in July.

CRU is forecasting the copper market will move from an almost 200,000 tonne deficit into surplus over the next three years, as additional mine supply is expected to hit the market.

Meanwhile, Codelco has reported its customers are demanding longer-dated contracts because they are worried about future availability of the metal. Customers in Europe have reportedly signed three and five-year contracts rather than the usual one-year contract.

There was also a sharp increase in European benchmark cathode premiums for 2023. While high energy costs have been the key driver of the increase, the rise has been partially attributed to consumers avoiding Russian metal. Aurubis and Codelco reportedly raised cathode premiums to $228/t and $234/t, respectively, for next year, a substantial increase from $123/t and $128/t for 2022 contracts.

While in the short-term, macro headwinds and recession fears are likely to put downward pressure on the copper market, the long-term fundamentals are looking more supportive amid low visible stocks, supply disruptions and expectations of a China recovery.

Global exchange stocks at record lows

This all comes against the backdrop of low inventories. Copper stocks in LME warehouses remain low, representing just two days' worth of global usage. Inventories on the SHFE and COMEX are also dangerously low. Between the three exchanges, the global copper inventories are now down to just a few days of consumption.

At least, for now, the copper market has a bit more clarity following the LME's decision to take no action on the delivery of Russian metals into LME warehouses after receiving a number of responses to its discussion paper. The LME was looking at potentially banning the delivery of Russian metal into its warehouses, limiting Russian flows or taking no action. In the lead-up to the decision, there were a number of producers who were quite vocal in calling for Russian metal to be banned, while consumers were keener for there to be no changes.

The LME said that instead it will start regularly disclosing the origin of all metal stocks on warrant from January 2023. As of 28 October, 58.1% of copper live tonnage was of Russian origin.

Russian copper is not officially sanctioned, but if we continue to see an increasing amount of self-sanctioning of Russian metals going into next year, the risk is that we see

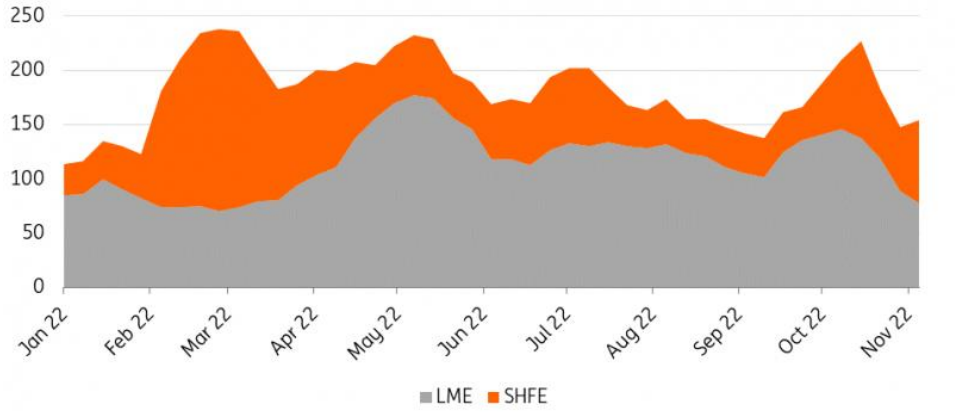
more Russian metal being delivered into LME warehouses, which could potentially mean that LME prices trade at discounted levels to actual traded prices.

The LME also announced that it will restrict new deliveries of copper and zinc from Russia's Ural Mining & Metallurgical Co. and one of its subsidiaries after the UK sanctioned the company's co-founder Iskandar Makhmudov. Starting immediately, metal from UMMC or Chelyabinsk Zinc unit can only be delivered to LME warehouses if the owner can prove to the exchange that it won't constitute a breach of sanctions, including that it was sold before Makhmudov was sanctioned by the UK on 26 September, and that neither company has any economic interest in the metal.

The LME said that UMMC copper which is currently listed in the LME warehouse system is not subject to the sanctions, and there is no zinc produced by Chelyabinsk in LME warehouses.

Russia produced 920,000 tonnes of refined copper last year, about 3.5% of the world's total, according to USGS, out of which – Nornickel – produced 406,841 tonnes. Asia and Europe are the main export markets for Russian copper.

Global exchange stocks are at multi-year lows



Source: ING research

Near-term headwinds but upside risks to dominate long-term

Recession fears, China's slowdown due to its Covid-19 restrictions, and the Fed's interest rate hiking path will continue to drive copper's short-term price outlook, however tightening supply should maintain the red metal's price support above $7,500/t throughout 2023.

We believe copper prices will remain under pressure until the global growth outlook starts to improve. Tight supply will then become the key focus for the market, which should support prices above $8,000/t in the last quarter of 2023.

Longer-term, we believe copper demand will improve amid the accelerated move into renewables and electric vehicles (EVs). In EVs, copper is a key component used in the electric motor, batteries, and wiring, as well as in charging stations. Copper has no substitutes for its use in EVs, wind and solar energy, and its appeal to investors as a key green metal will support higher prices over the next few years.

ING forecast

	1Q23	2Q23	3Q23	4Q23	FY23
LME Copper (US$/t)	7,500	7,600	7,800	8,100	7,750

Source: ING research

Nickel surplus to build

Nickel has had a tumultuous year amid Russia's invasion of Ukraine in February and March's short squeeze, and the subsequent temporary suspension of LME nickel trade. The short-term outlook for nickel remains bearish amid a deteriorating macro picture and sustained market surplus

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Nickel price slips on recession fears

The metals complex has had a volatile year. Most metals performed strongly in the first quarter given the growing supply uncertainty due to Russia's invasion of Ukraine. However, a stronger US dollar, rising rates and weaker downstream demand weighed heavily on metals markets for the remainder of the year. Nickel is the standout across the complex, managing to hold onto year-to-date gains. Still, the LME price is down significantly from its year-to-date highs in March following a short squeeze, as recession fears have undermined market sentiment.

Volatility in the nickel market has become more common in recent months with reduced liquidity ever since the short squeeze seen back in March, when fears of sanctions on Norilsk Nickel coincided with a huge short bet by the world's largest stainless steel producer, Tsingshan. This caused prices to more than double in a matter of days. The LME was forced to suspend trading for a week and cancel billions of dollars' worth of nickel trades.

The LME has subsequently imposed price limits for the first time and introduced requirements for disclosure of business done over the counter via derivatives to the exchange.

LME volumes have declined since then as many traders have reduced activity or cut their exposure due to a loss of confidence in the LME and its nickel contract after its handling of the March short squeeze. Volumes on the LME three-month nickel contract since March have been 30% of levels in the six months before the market chaos following the short squeeze.

These low levels of liquidity have left nickel exposed to sharp price swings – even amid small shifts in supply and demand balances.

Most recently, nickel prices on the LME spiked briefly to hit the LME's daily trading limit of 15%, reaching almost $31,000/t, on a report of an explosion at an Indonesian plant. Gains were pared after the facility's owner denied any incident. That was followed by a 5% rise the following day after a nickel mine in New Caledonia, which supplies Tesla, cut its 4Q production forecast.

In an effort to stabilise the recent volatility, the LME said it undertook "enhanced monitoring" of market participants' trading activities and lifted initial margins for nickel trades by 28% to $6,100/t.

The LME recently defended its decision in a legal filing following lawsuits from Elliott Investment Management and Jane Street, saying that the spike in nickel prices on 8

March would have led to margin calls of about $19.75 billion if the trades hadn't been cancelled. The exchange said that subsequent analysis has shown that at least seven clearing members would have gone into default. On the morning of 8 March, six members had not paid their overnight margin payments, totalling $2 billion. The bourse said that it saw the risk of a 'death spiral' without nickel trade cancellations.

We expect more near-term volatility to continue until the LME rebuilds trust in the benchmark nickel contract, volumes pick up again and the market's confidence in it recovers.

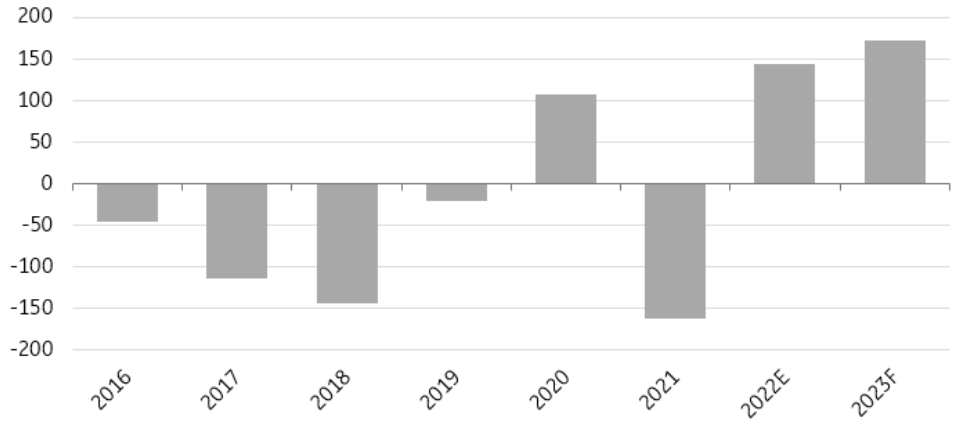
Weak stainless steel output pushes nickel to surplus

Continued weakness in demand from the stainless steel sector has meant that the global nickel market is expected to be in surplus this year. However, the surplus is mostly in the class 2 - ferronickel and NPI - market. The LME deliverable class 1 market has been relatively tight with LME stocks falling by around 50kt since the start of the year and recently hitting a 14-year low. The reported LME stocks are now below three weeks of consumption – another factor driving the price swings in the LME nickel contract.

The International Nickel Study Group (INSG) expects nickel to record a surplus of 144kt this year and another 171kt in the next year. Historically, market surpluses have been linked to the LME deliverable class 1 nickel but in 2023 the surplus will be mainly due to class 2 and nickel chemicals – predominantly nickel sulphate, which is used in batteries, according to the INSG.

The INSG has also cut its global demand forecast for this year from 8.6% in May to 4.2%, reflecting a slide in stainless steel production.

Nickel supply/demand market balance (kt)



Source: INSG, ING Research

Global stainless growth to fall

Stainless steel is still key for nickel demand, accounting for 70% of total nickel consumption. Although demand from the battery sector is growing rapidly, making up around 5% of total demand at the moment, it isn't enough to offset a slowdown in traditional sectors like construction.

China's strict zero-Covid policy has hurt the country's construction sector and has weighed on demand for nickel.

However, more recently, hopes have grown that fresh stimulus measures by China could boost demand for industrial metals after moves to shore up the country's property sector and ease its Covid restrictions.

China's recent relaxation of its Covid-related quarantine measures includes a reduced quarantine period for inbound travellers and close contacts of those who have tested positive while secondary contacts will no longer need to be traced. China is also pushing for greater vaccination of the elderly following protests over strict Covid curbs across the country - which are likely to weigh on sentiment further. At the same time, China's total case count remains elevated, while Beijing has reported its first Covid deaths in six months.

China's relaxation of its Covid policy would have a significant effect on the steel market, and by extension on the nickel market. However, we believe the government is likely to stick to its zero-Covid policy through the winter and may only look to ease some of the curbs further after the National People's Congress due to be held in March or April next year.

Indonesia supply growth in focus

Meanwhile, Indonesia's production of nickel is surging to meet growing demand from the electric vehicle (EV) battery sector.

The country's output was up 41% year-on-year in the first seven months of 2022, according to INSG. Year-to-date production of 814,000 tonnes accounted for 47% of the global total, compared with 38% over the same period of 2021.

Indonesia is the world's largest nickel producer, accounting for 38% of global refined supply. The country holds a quarter of the world's reserves of the metal with much of Indonesia's output being of lower purity and used in stainless steel.

Indonesia is expected to produce between 1.25 and 1.5 million tonnes of nickel this year, more than 40% of world mined production estimated at between 3 million to 3.2 million tonnes, according to data from USGS.

We believe rising output in Indonesia will pressure nickel prices next year.

Supply risk around Russian metal remains

There are still plenty of supply risks around Russian metal. The LME has decided not to suspend Russian nickel, but the threat of government sanctions will remain as long as the war in Ukraine rages on.

The LME was looking at potentially banning the delivery of Russian metal into its warehouses, limiting Russian flows or taking no action. The exchange said that it is likely that additional tonnages of Russian metal will, in time, if not immediately, be warranted in the LME's physical network.

Russia is the third largest primary nickel producer after Indonesia and China and the largest exporter of refined nickel metal – the type deliverable on the LME. Europe is one of the key destinations for Russian metal.

Everything depends on how many players choose not to take Russian metal in their 2023 supply contracts unless there are government sanctions. If we see more Russian metal being delivered into LME warehouses, it could potentially mean that LME prices trade at discounted levels to the actual market.

However, the LME said that the proportion of Russian metal in LME warehouses has not changed significantly over the discussion paper period.

In 2013, 65% of LME nickel inventories were of Russian origin. In more recent years, this has ranged between 0-20%. According to the latest data from the LME, only 0.5% of live nickel tonnage in its warehouses was of Russian origin.

The LME said it will publish a monthly report, starting in January 2023, which will provide the percentage of live tonnage of Russian metal on-warrant in order to provide more transparency.

Prices to remain under pressure as surplus builds

We forecast nickel prices to remain under pressure in the short term as a surplus in the market builds, however, the tightness in the class 1 market is likely to offer some support. We see prices hovering between $20,000/t and $20,500/t over the first two quarters of 2023 before gradually increasing to $21,000/t in 3Q and $22,000/t in 4Q as the global growth outlook starts to improve.

ING forecast

	1Q23	2Q23	3Q23	4Q23	FY23
LME Nickel (US$/t)	20,000	20,500	21,000	22,000	21,000

Source: ING research

Gold to rebound as Fed easing starts

US dollar strength and central bank tightening have weighed heavily on the gold market in 2022. In the near term, there is room for more downside with further tightening expected. The medium-term outlook looks more constructive

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US strength hits gold prices

Spot gold is trading at its lowest levels in more than two years and has fallen more than 20% from its peak of above $2,000/oz in March as the US Federal Reserve and other central banks have raised rates to tackle inflation.

The strengthening of the US dollar has hit sentiment across the commodities complex, including gold. The USD index has surged to a 20-year high. This strength is largely a result of the aggressive stance the Fed has taken in terms of monetary tightening to fight inflation.

Real yields have also been climbing. Ten-year real US yields have reached their highest levels in more than a decade and are back in positive territory. Given the strong negative correlation between gold prices and real yields, gold has struggled in this rising yield environment. Higher yields increase the opportunity cost of holding gold, which appears to be turning investors off the precious metal.

Record gold buying from central banks lifts global demand

So far this year central banks have continued to increase gold reserves. During times of economic and geopolitical uncertainty and high inflation, banks appear to be turning to gold as a store of value.

The latest data from the World Gold Council (WGC) shows that central banks increased their buying of gold significantly over the third quarter. Central banks bought 399 tonnes in 3Q22, which is up 341% year-on-year and also a record quarterly amount. The data shows that Turkey, Uzbekistan, India and Qatar were the largest buyers of gold over the quarter, but a substantial amount of gold was also bought by central banks that did not publicly report their purchases. The WGC did not give any details on which countries these could be, although banks that do not regularly publish information about their gold stockpiles include China and Russia.

The pace at which central banks have accumulated gold reserves this year has not been seen since 1967.

Given the current environment is likely to persist, central banks are likely to continue to add to their gold holdings in the months ahead.

The gold purchases made by central banks around the world constitute only a portion of the total demand for bullion, which also includes the consumption of jewellery, investments in gold bars, coins, exchange-traded funds (ETFs), and technology.

Chinese gold demand picks up, but Covid risks remain

Chinese gold demand suffered earlier in the year due to the Covid-related lockdowns, particularly over the second quarter of the year, which is when strict restrictions were in place across Shanghai and Beijing. According to WGC data, Chinese consumer demand was down 23% YoY over 1H22.

However, more recently, gold in China has been trading at a huge premium to international prices as improved demand exceeds the country's imports, which are constrained by quotas. Only accredited banks in the country are allowed to import gold, with quantities set by the People's Bank of China.

The elevated Shanghai-London gold price spread has continued in October with the seven-day National Day holiday, a stable local price, weak renminbi and economic uncertainty supporting gold sales in Beijing and Shanghai, according to data from the WGC. However, fluctuating Covid-19 cases and subsequent lockdowns could weigh on gold sales in certain areas going forward.

For another key gold consumer, India, demand remained strong in October amid the onset of festivals and weddings season with both jewellery and bar and coin purchases boosted.

Despite stronger consumer demand, gold's price direction will continue to be driven by investment flows, for which the outlook is less constructive in the short term.

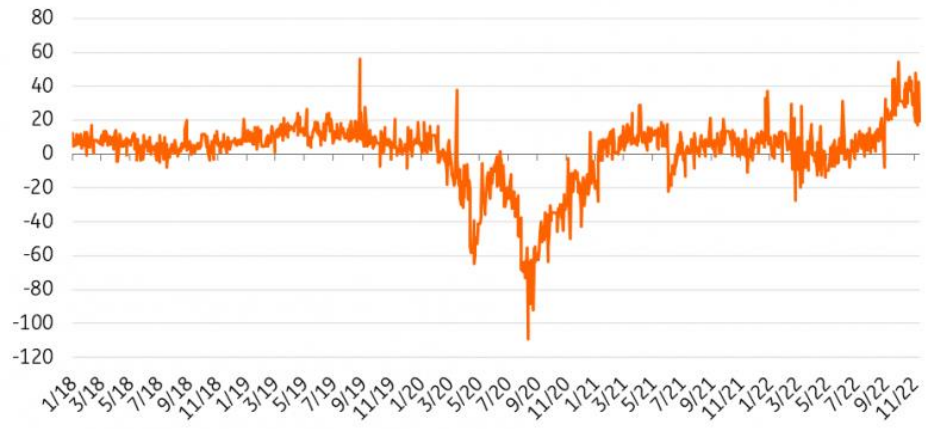
Global gold ETF holdings saw their sixth consecutive monthly decline in October, standing at 3,490t (US$184bn) at the end of the month. North American funds led global outflows.

In the third quarter, investment demand was down 47% year-on-year, as ETF investors responded to a challenging combination of markedly higher interest rates and a strong US dollar.

Speculative positioning in COMEX gold further highlights the lack of investor interest – the latest COMEX exchange numbers showed that speculators in US gold futures were betting on lower prices, however, the number of the bets had declined.

China's gold imports surge

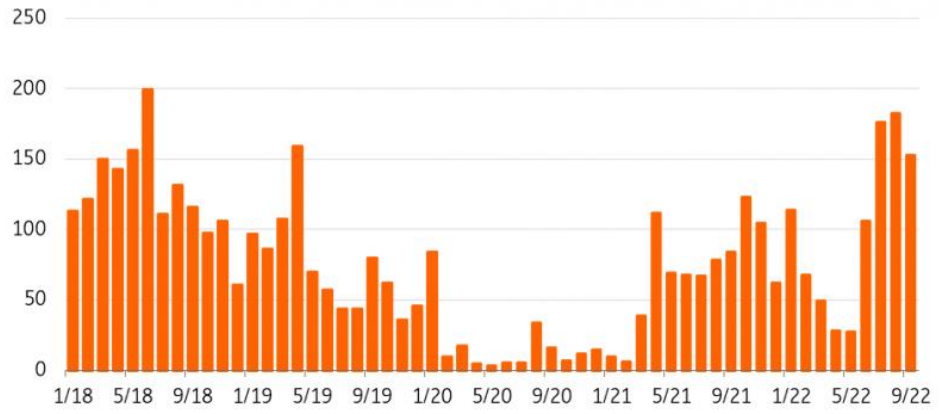
China premium/ discount to international gold ($/oz)



Source: WGC, ING Research

China's gold imports surge

China non-monetary gold imports (tonnes)



Source: China Customs, ING Research

Gold to rebound slightly next year as Fed easing starts

We expect gold to remain on a downward trend during the Fed's ongoing tightening cycle. But while in the short term we see more downside for gold prices amid monetary tightening, any hints from the Fed of an easing in its aggressive hiking cycle should start to provide support to prices. For this to happen, we would likely need to see signs of a significant decline in inflation.

We should see inflation coming off quite drastically over 2023 and this will then open the door for the Fed to start cutting rates over 2H23, according to our US economist.

Under the assumption that we see easing over 2H23, we expect gold prices to move higher over the course of 2023 with prices reaching $1,850/oz in 4Q23.

ING forecasts

	1Q23	2Q23	3Q23	4Q23	FY23
Spot Gold (US$/oz)	1,680	1,730	1,800	1,850	1,765

Source: ING research

Iron ore's rout to continue until China recovers

Iron ore has been one of the worst-performing commodities this year. Concerns over Chinese macroeconomic performance and continued Covid-19-related disruptions have been key to driving prices lower. Hopes of a China recovery in the second half of 2023 should provide support in the medium term. The short-term outlook is more bearish

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Gloomy demand outlook

Iron ore prices have roughly halved from their year-to-date high of US$171/t seen back in March to as low as $81/t recently – almost its lowest since early 2020. Futures in Singapore have fallen for seven consecutive months, the worst run since the contract debuted in 2013. China's attempts to crush outbreaks of Covid-19 have seen tough restrictions, which have not been supportive of the country's property market, the main driver of iron ore demand. China alone accounts for about two-thirds of seaborne iron ore demand.

The sentiment has deteriorated since China's 20th Communist Party Congress with the property sector policy tone remaining downbeat and the government continuing to maintain the principle that "housing is for living in, not for speculation".

China's property sector accounts for almost 40% of its steel consumption. That sector has been in a steep decline for more than a year amid continued tightening of housing measures across China since March when cities began to introduce a sales ban.

China's home sales declined again in October, reflecting the difficulties facing the property market, as the slowing economy and ongoing Covid-19 outbreaks dampened homebuying demand.

In the 10 months from January through October, national home sales dropped 25.6% in terms of square meters and 28.2% in terms of value, according to data from the National Bureau of Statistics. Property investment dropped 8.8% over the period, worsening from an 8% decline in the first nine months. New construction starts by property developers in the country fell 37.8% between January and October, compared with the 38% decline between January and September, with developers reluctant to start new construction.

The World Steel Association expects Chinese steel demand to fall 4% for the whole year, driving a projected 2.3% drop in global demand amid surging inflation and rising interest rates. In 2023, new infrastructure projects and a mild recovery in the real estate market could prevent further contraction of steel demand.

Looking forward, the outlook for iron ore is going to largely depend on how China approaches any further Covid outbreaks as well as the scale of stimulus the Chinese government unveils.

Most recently, China's regulators announced a 16-point plan to rescue the country's property sector. The measures include encouraging banks to lend to developers and loosening down payment requirements for homebuyers.

China's GDP is expected to fall to 3.3% this year, according to forecasts by our China economist, well below the government's 5.5% target. At the same time, global demand for steel is weakening as central banks tighten monetary policy. In 2023, the International Monetary Fund predicts China's GDP to grow by 4.4%. Meanwhile, Chinese government advisers said they will recommend modest economic growth targets for next year ranging from 4.5% to 5.5%

Demand outside of China also struggling

Steel demand across the rest of the world has been weakening as well, reflecting the impact of high energy prices as well as central bank's increasing interest rates.

In the EU, steel demand is expected to contract by 3.5% in 2022, according to the World Steel Association. With immediate improvement in the gas supply situation not in sight, steel demand in the EU will continue to contract in 2023 with significant downside risk in case of harsh winter weather or further disruptions to energy supplies.

On the supply side, in the January-September period of this year, crude steel production within the European Union fell by 8.2% compared with the same period a year ago, to 105.8 million tonnes, based on WSA data. Japan's production was down by 6% at 67.8mt, while South Korea's volume decreased by 4.4% to 50.5mt.

India is the only bright spot in the global steel market with the country's output reaching 93.3mt in the January to September period, a rise of 6.4% year-on-year.

Total production is forecast to grow 6.1% in 2022 and 6.7% in 2023 in line with the Indian Government's target to double national production capacity to 300 million tonnes by 2030-2031 on the back of strong urban consumption and infrastructure spending, which will also drive demand for capital goods and automobiles. India's growth figure is the highest among top global steel consumers.

Most recently, India has unexpectedly removed export duties on a number of steel products and iron ore, which were imposed back in May. This includes iron ore lumps and fines with less than 58% iron content and iron ore pellets. Meanwhile, iron ore lumps and fines with an iron content of more than 58% will still attract a 30% duty. This will mean iron ore producers will return to the export market, but the extent of imports will depend on demand from its main importer, China. Iron ore prices traded under pressure following the announcement.

China steel output lags

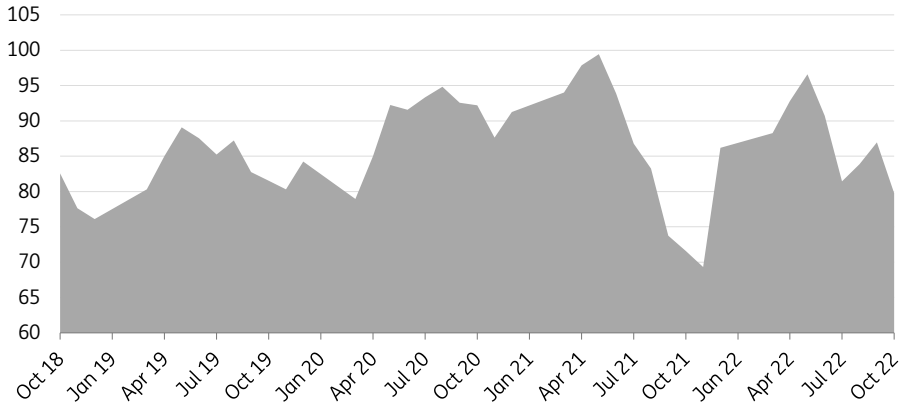
Chinese steel output has also been under pressure for much of the year. The start of 2022 saw output cuts in some regions during the winter Olympics weigh on national output, whilst in more recent months Covid lockdowns have weighed further on both steel demand and supply.

Negative steel margins have prompted mills to intensify output cuts ahead of the winter steel curbs, with around 20 shutting down blast furnaces and speeding up annual year-end maintenance, shutting off at least 100,000 tonnes of daily output. Steelmakers in China are usually ordered to decrease production during the winter months to cut back on pollution.

China's steel production is falling – in large part because of China's property crisis. China's total steel production from January to October came to 860.57 million tonnes, down 2.2% on the same period last year, and compared with a 3.4% year-on-year contraction in January-September, according to data from the National Bureau of

Statistics. Meanwhile, China's cap on annual steel output to limit carbon emissions paints a bleak picture for iron ore demand going forward.

China monthly crude steel output (million tonnes)



Source: WSA, ING Research

China iron ore imports slow down

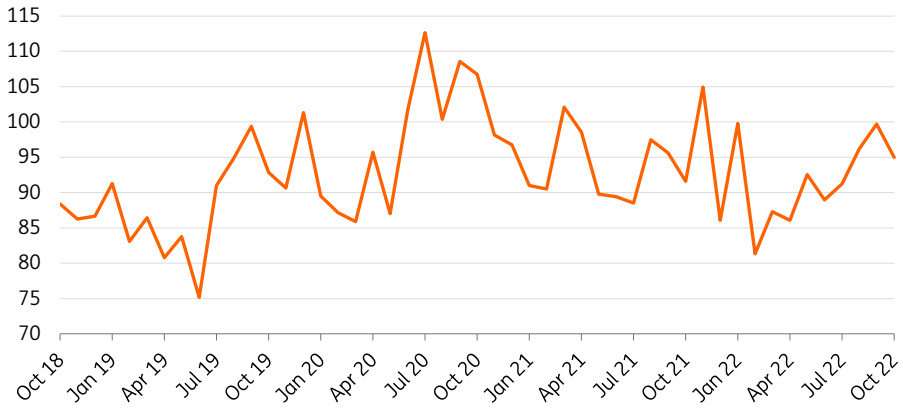
Amid lower steel output from China, iron ore imports have also been under pressure this year.

The world's top consumer brought in 94.98mt of iron ore in October, down from September's 99.71mt, the General Administration of Customs said, while they fell 1.7% year-on-year to 917mt in the first 10 months of the year.

At the same time, iron ore inventories at Chinese ports have been growing since mid-October, reaching 136mt in mid-November. China's iron ore port inventory is a key indicator that reflects the supply and demand balance, as well as the safety net and imbalance between the iron ore supply and the steel mill demand.

With the peak construction season coming to an end and with the expected demand recovery not meeting expectations, there is little upside for steel output and iron ore demand in the short to medium term.

China monthly iron ore imports (million tonnes)



Source: NBS, ING Research

Australian supply to edge higher, Brazilian shipments suffer

The supply side has been mixed with Australian exports increasing this year due to a strong performance by majors, while supply from Brazil, the world's second-largest exporter behind Australia, is slightly below last year's levels with the country struggling to see iron ore shipments return to levels seen prior to the Brumadinho dam disaster in January 2019.

In 2021, total Brazilian iron exports totalled 358mt, still down from the 371mt exported in 2018. Exports in 2022 have struggled as well with total shipments of iron ore from Brazil at around 154mt in the first half of 2022.

Vale's year-to-date production fell to 227mt, which marks a 1.9% decline year on year. This is primarily due to the 6% drop in production reported in the first quarter of 2022 due to the heavy rainfall in Minas Gerais in January that halted the Southern and Southeastern Systems operations.

Vale has recently cut its production guidance for 2022 to 310-320mt from 320-335mt, compared to the production of almost 316mt last year. Looking further ahead, Vale still aims to reach 400mtpa of annual capacity.

Total Brazilian exports are forecast to reach 347mt in 2022, a fall of around 2.8% compared with 2021.

Meanwhile, Australia is in the process of ramping up supply from a number of new projects, of which the largest is BHP's 80mtpa South Flank mine which started operations in 2021. This follows the start-up of Fortescue's 30mtpa Eliwana mine which commenced operations in late 2020 and has ramped up output since. For this year, Rio's 43mtpa Gudai Darri mine started operations in June, while Fortescue was meant to start operations at its 22mtpa Iron Bridge mine this year, but the start date of this has been pushed into 1Q23.

These new projects, along with some expansion projects, could add to the downside pressure on prices.

The majors have recently released third-quarter reports, with FMG reporting a 2mt YoY increase to 47.5mt, Rio Tinto adding 1mt YoY to 84mt, and BHP also contributing an additional 1.5mt YoY to 72mt.

Australian iron ore export volumes were 0.9% higher year-on-year in the first half of 2022, with new greenfield supply starting to come online from major producers. Exports are forecast to increase by 3.1% in 2022-23 to reach 903mt and rise by 3.8% to 937mt in 2023-24, according to Australian trade data (Department of Industry, Science and Resources).

Looking ahead, we should continue to see the ramping up of supply from new projects in Australia, along with Vale continuing to target an annual production capacity of 400mtpa.

Iron ore prices to ease in the short term

There is more downside ahead for iron ore as there are fears that China's strict zero-Covid policy is here to stay in the near term, despite the recent easing of Covid restrictions and the government's pledge to bolster vaccinations among senior citizens. We believe the Chinese government is likely to stick to its zero-Covid policy through winter. China continues to see record daily cases of Covid, which has resulted in some cities tightening mobility restrictions. Reports of Covid protests in China will also likely prove harmful to sentiment.

We believe the short-term outlook remains bearish with sluggish demand from China suggesting that prices should trend lower. We expect prices to slide to $85/t in the first quarter of 2023 and hover around $90/t throughout the second and third quarters.

Prices should be supported in 2H23 due to expectations of a recovery in China and easing Covid-19 restrictions, with prices moving above $95/t in 4Q.

However, it appears that China will continue to cap crude steel output whilst also looking to replace older steel capacity with electric arc furnace capacity in order to help the

country meet its decarbonisation goals. Growth in electric arc furnace (EAF) capacity at the expense of basic oxygen furnace (BOF) capacity will be a concern for the medium to long-term outlook for Chinese iron ore demand. It also suggests that we have already seen China's iron ore imports peak in 2020.

ING forecast

	1Q23	2Q23	3Q23	4Q23	FY23
Iron Ore 62% Fe (US$/t)	85	90	90	95	90

Source: ING research

Turbulence in fertiliser markets weighs on crop outlook

Fertiliser supply decreased in 2022 and prices rose to record highs causing a global drop in demand. High gas prices, sanctions, and export restrictions have resulted in a shift in trade which will continue into 2023. Meanwhile, the lower use of fertilisers will weigh on crop yield expectations for the upcoming season

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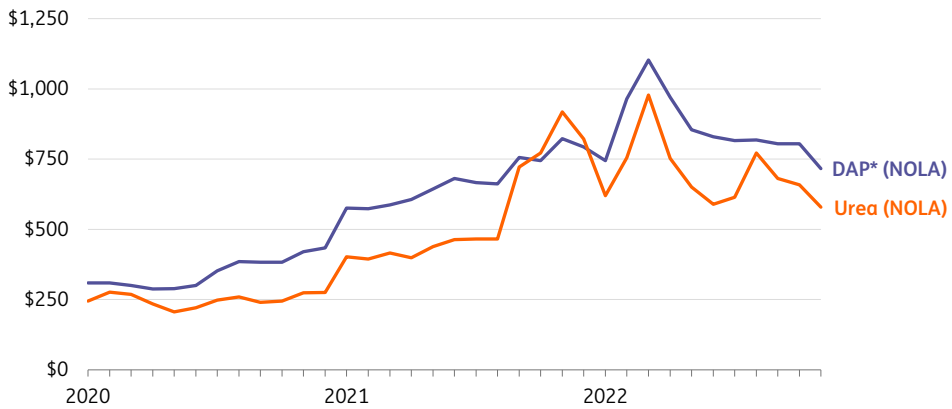
High prices create ripple effects

The war in Ukraine, Western sanctions on Russian and Belarussian exports, and Chinese export restrictions have created turmoil in fertiliser markets. The surge in fertiliser prices that started in 2021 led to deteriorating farmer affordability during 2022 and lower demand. Uncertainty about the amount of fertiliser that farmers are going to need for the upcoming season leads to a more muddied outlook for next year's crop yields. This has an upward effect on commodities futures. Although the urgency of the situation for global food security is increasingly being recognised, there are reasons to be cautious about any quick improvements in the situation. History shows that unwinding sanctions often prove to be quite a sticky process against a backdrop of geopolitical tensions.

Fertiliser prices are still high despite recent falls

Monthly prices per metric ton



*DAP = Diammonium phosphate
Source: Refinitiv, ING Research

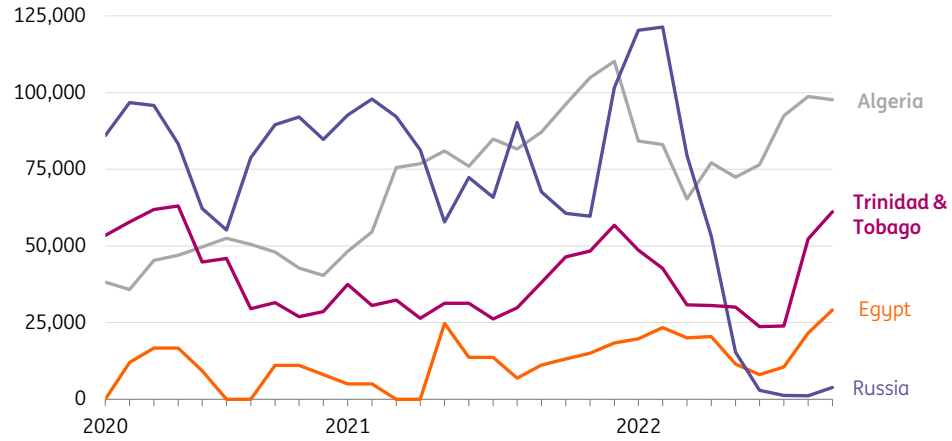
Considerable shifts in fertiliser trade

Buyers have been busy this year finding alternative suppliers due to the sharp drop in fertiliser exports from Russia (nitrogen, potash), Belarus (potash), China (nitrogen, phosphate) and the EU (nitrogen). In the EU, lower local ammonia and urea production in combination with a reduced inflow of Russian products has been partially offset by imports from other countries such as Egypt and Algeria. This is also happening with potash where Belarussian exports to the EU have ceased, and Russian imports dropped by more than 70% up until September. Those decreases are partially made up by a 25%

increase in potash imports from Canada. In the process, European buyers are crowding out other buyers, similar to what has been happening in liquefied natural gas (LNG) markets. Meanwhile, other large importers, including Brazil, China, India and the US, have not turned away from Russian fertilisers and absorbed some of the flows that have become available, as they have generally worked out how to deal with any additional red tape.

The EU is turning to other countries for ammonia imports

Import volume in tonnes, 3-month average, January 2020 to September 2022



Source: Eurostat, ING Research

Prospects for 2023

High prices drive producers across the globe to ramp up production at existing sites and increase investments in new capacity which has a downward effect on prices. Still, it's likely that part of the supply gap in 2023 will remain. Geopolitics is a major factor in how the market will evolve in 2023 as European sanctions on exports from Russia and Belarus are particularly influential. Both a de-escalation of the war in Ukraine and global pressure to reduce restrictions on fertiliser trade flows for the sake of food security could lead to a winding down in sanctions. This could, for example, result in the reopening of the Tolyatti-Odessa ammonia pipeline (output: 2.5 million tonnes, 1.5% of global production) and the release of fertiliser cargoes stuck in European ports. However, further tightening of sanctions cannot be completely ruled out in case the war in Ukraine escalates.

Impact on food production

In our view, the impact of the increase in fertiliser prices on crop yields has been soft this year as many farmers buy fertiliser ahead of the season and affordability was still quite favourable at the start of 2022 due to high commodity prices. But during the course of 2022 fertiliser imports in major markets such as India and Brazil have dropped below the levels of the previous year. The impact on yields could become more pronounced in 2023, especially in African and Asian countries where farmers have generally fewer means to adapt and get less government support compared to their counterparts in Europe, the US and China.

Still, the process is likely to be gradual for two reasons. First, while the lower application of nitrogen fertilisers is directly affecting yields, the reduced use of phosphate and potash has a longer lag before it kicks in. Second, some of the impact can be mitigated by farmers and such mitigation can also be in the interest of food traders and manufacturers. Farmers could invest in the more precise application of (liquid) fertilisers, increase the use of organic fertilisers (like biochar) or opt to shift to crops that require less fertiliser (such as legumes or cassava). All of these have their drawbacks and limitations. Shifting to a different crop, for example, requires specific knowledge to be successful. So overall it will be hard to match the effectiveness of synthetic fertilisers. As always, favourable weather in the major growing regions during the season can ease some of the impact of under-fertilisation, while bad weather can cause more problems.

Wheat supply risks will linger

Global wheat markets are likely to tighten over the 2022/23 season. Meanwhile, there are already several supply risks building for the next marketing year, which should support prices through 2023

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2022/23 balance tightens

Despite the fact that Ukraine has produced significantly less wheat in the 2022/23 season, global wheat production is still expected to edge higher in the current season. This is predominantly driven by a recovery in Canadian output as well as Russia producing a record harvest this season in excess of 90mt. However, even with supply growth, global wheat ending stocks for 2022/23 are expected to tighten to a little less than 268mt – the lowest levels since 2016/17.

Given the significant amount of inventory carried in China, ex-China stocks are significantly tighter, standing at around 123mt – the lowest level since 2007/08.

It is clear that Ukrainian wheat output this season has suffered. Due to the ongoing war, not all acreage would have been harvested. Ukraine planted more than 6m hectares of winter wheat for the 2022/23 season, but only around 4.6m hectares were harvested. As a result, Ukrainian wheat output is estimated in the region of 20mt, down from 33mt in the previous season. However, clearly the issue around Ukrainian supply this season is not just about production but the ability to export. The Black Sea Grain Initiative has allowed for larger export volumes. Although, wheat exports are still down around 55% year-on-year, whilst full season exports are expected to decline by 42% YoY to a total of 11mt. While the Black Sea grain deal was recently renewed, there is still plenty of supply risk from the Black Sea.

However, Russian wheat output has performed strongly this year and farmers are expected to harvest a record crop in excess of 90mt. This is a result of good growing conditions. Russian wheat exports had struggled initially in the season, but the pace appears to have picked up recently. While there are no specific sanctions against Russian food product exports, there will be a fair amount of self-sanctioning and so potentially more difficult to get financing, shipping and insurance for this trade. It is estimated that Russia could export 42mt of wheat in 2022/23, up from 33mt last season. These exports would still be below full potential and so Russia is expected to carry a larger amount of stock into next season.

The United States is expected to see the total wheat output in 2022/23 remain largely unchanged from 2021/22. This is despite a strong recovery in spring wheat output. Output in 2022/23 is estimated at 1.65b bushels (44.9mt), up 0.2% YoY, although this is still below levels seen in recent years. As a result, US ending stocks for 2022/23 are expected to be the tightest they have been since 2007/08.

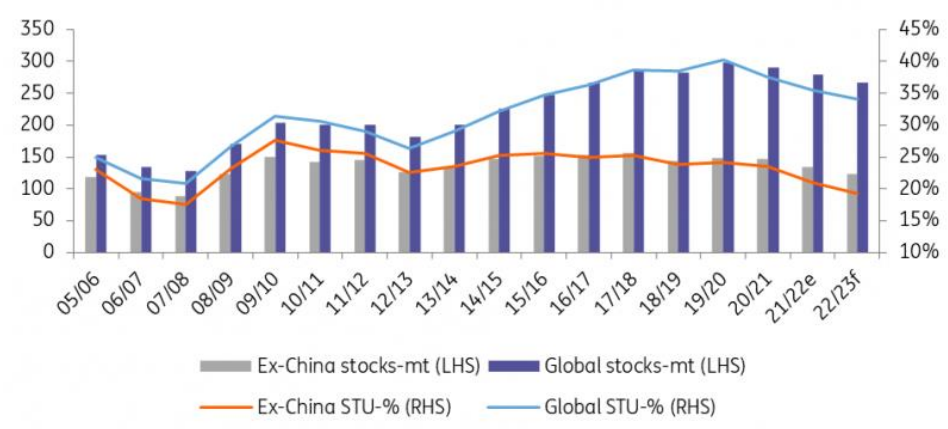
Drier weather in Europe has weighed on wheat yields in the European Union. These lower yields have offset larger acreage in the region. As a result, total EU wheat output

in 2022/23 is estimated to have fallen by almost 3% YoY to 134mt. This lower output is expected to lead to a sizeable drop in EU ending stocks.

As for India, there had been a lot of noise around the government putting in place an export ban on wheat earlier this year. This was due to concerns over a domestic heatwave along with broader concerns over rising food prices following Russia's invasion of Ukraine. While India is a large producer of wheat (in excess of 100mt), it is a marginal exporter. Therefore, regardless of the export ban, India would have not been able to play a significant role in offsetting Ukrainian supply losses.

Australia is expected to see its second-largest wheat crop on record in 2022/23, with expectations of a 34.5mt crop. The harvest is currently underway. And while heavy rainfall for much of the year has seen crop prospects grow as we have moved through the year, this rainfall will raise some concerns over quality. In addition, whilst Australia is on course to produce a second consecutive large crop, there are export capacity constraints, which will limit how much of this volume can come out in a timely manner.

Global wheat ending stocks



Source: USDA, ING Research

Potential for lower output from key producers in 2023/24

As things stand, risks are skewed towards a tighter wheat balance in the 2023/24 marketing year. The key uncertainty is around Ukraine, not only in terms of how much wheat is produced, but also if this supply will be able to be exported. The Black Sea Initiative has been renewed for 120 days, but clearly risks to these flows remain. In addition, weather as usual will play an important role and right now there are already concerns for the next US winter wheat crop. It is also important to bear in mind the potential for lower fertiliser usage leaving crop yields more vulnerable next year.

In America, the United States Department of Agriculture (USDA) expects that plantings for 2023 wheat will increase by 3.9% YoY to 47.5m acres. The general strength that we have seen in wheat prices this year should prove supportive for plantings. However, there are already concerns over US winter wheat. Winter wheat is in the worst condition it has been for this time of year in at least 20 years – a little more than 30% of the winter wheat crop is rated good-to-excellent. The poorer condition of the crop is due to drought conditions with 75% of the winter wheat area under drought at the moment, while more than 50% of the crop area is suffering from at least severe drought.

This does suggest that we could see some downside to winter wheat yields, and this is key for total US output given that winter wheat makes up, on average, around 70% of total wheat output. However, this poor crop condition does not guarantee that yields will be lower, but the risks are certainly growing for the US domestic wheat balance to tighten further next season.

Ukraine would have seen lower plantings of winter wheat for the 2023/24 due to the ongoing war. According to ministry data, the winter wheat area for next season is expected to total 3.8m hectares, which is down 38% from this year. Although not all wheat areas this season would have been harvested. If we compared the projected planting for next season to the estimated harvested area for the current season, it would be a 17% decline. So, Ukraine will see a smaller wheat crop for next season. For spring crops, there is obviously much more uncertainty as this will depend on how the war evolves over the coming months.

It appears as though it will be a challenge for Russia to repeat its current record harvest. Heavy rainfall has delayed winter plantings, whilst weaker prices in Russian ruble terms and export taxes do not help. Therefore, it is likely that area will shrink next season. Early estimates suggest that Russian wheat output could shrink between 10-15% next season.

What does this mean for prices?

Early estimates indicate that we could see a further tightening in the 2023/24 global balance, which suggests that wheat prices are likely to remain fairly elevated and well-supported. A key downside risk to this view would be de-escalation in the Russia/Ukraine war, as this would likely remove a fairly large risk premium in the market.

ING wheat price forecasts

	1Q23	2Q23	3Q23	4Q23	FY23
CBOT Wheat (Usc/bu)	850	840	850	870	850
Euronext Milling Wheat (EUR/t)	340	325	325	335	330

Source: ING research

Sugar surplus should limit upside

The global sugar market is set to see yet another surplus, driven by expectations of stronger output from Brazil, India and Thailand. We believe the surplus environment should limit further upside in sugar prices through 2023

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2022/23 global surplus

Global sugar output in the 2022/23 marketing year is expected to hit around 180mt, which would leave it near record levels. Stronger output is largely due to expectations of higher output from Brazil. This production growth should mean that the global sugar market will see yet another surplus in the 2022/23 season- in the region of 4mt. This surplus should cap prices although we could see seasonally stronger prices over the CS Brazilian off-crop (1Q23). How much strength will really depend on how Indian sugar exports perform.

CS Brazil to see larger 2023/24 crop

The current Centre South Brazilian crop is quickly coming to an end as the region moves deeper into the rainy season. The industry is expected to crush around 530m tonnes of sugarcane (vs. 523mt last season) and with a sugar mix approaching 46%, sugar output is expected to total 32.5mt tonnes, marginally up on the 32mt produced the previous season. Changes to fuel taxes this year in Brazil (due to high prices) led to lower gasoline prices. The ethanol/gasoline parity has been above 70% for much of the current season, which saw motorists deciding to fill up with gasoline rather than hydrous ethanol this year. As a result, domestic ethanol demand in Brazil has been weak this year.

The industry started the crush late this season and given the fact that the region is entering the rainy season, it's unlikely all cane will be harvested this season. Therefore, there is the potential for an early start next season, so that mills can crush this stood-over cane. An earlier start to the 2023/24 crush would be helpful to the global market as it would ease some of the seasonal tightness during the off-crop. Furthermore, harvesting stood-over cane next season suggests that we will see a larger CS Brazil crop next season.

Given the more recent strength in sugar prices along with a generally weak Brazilian real, sugar returns for Brazilian mills are attractive in BRL terms. As a result, we would expect that mills increase their sugar mix for the upcoming 2023/24 season, which officially gets underway in April. However, with the change in government, we could also see some changes to the domestic fuel policy, which could have a knock-on effect on the sugar/ethanol production mix.

While recent rainfall has proved disruptive for the current harvest, this rainfall is likely to prove beneficial for the 2023/24 crop. The size of the 2023/24 season will depend on how the rainy season develops but early estimates suggest that CS Brazil could crush close to 570mt of cane. A larger cane crush and expectations of a stronger sugar mix suggest

the region could produce in excess of 34.5mt of sugar next season. This would be the highest output from the region since 2020/21.

How much will India export in 2022/23?

Following Russia's invasion of Ukraine, India has been concerned about inflation, which saw the government take steps to try to limit domestic price increases. This has seen the government take action to restrict exports of wheat, rice and sugar. In the 2021/22 season, mills were allowed to export 11.2m tonnes of sugar. And even though India is set to produce another large crop in the 2022/23 season, the government has decided to set the quota for the current 2022/23 season at 6m tonnes. To be fair, this quota runs until the 31 May. The government will then decide on whether to issue another tranche of export quotas for the remainder of the season (June-September). There are reports suggesting that an additional 3m tonnes of quotas could be made available at a later date. This will obviously be dependent on how the 2022/23 crop develops and ultimately domestic prices.

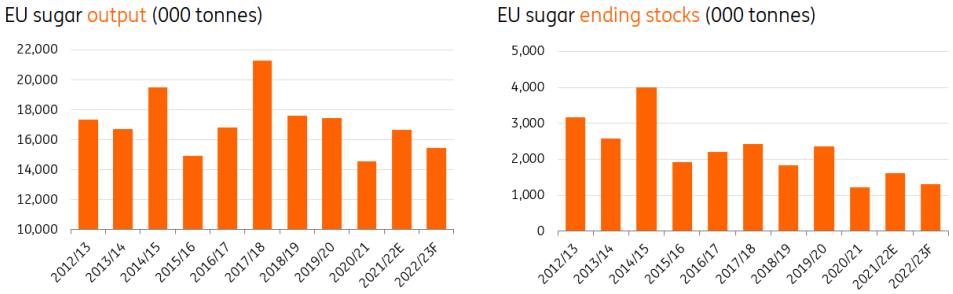
In addition, there have been reports of a small number of Indian mills defaulting on export contracts and trying to renegotiate at higher levels given the more recent strength in the world market. However for now, the tonnage of defaults appears to be marginal.

India is expected to produce 36.5m tonnes of sugar, an increase of almost 2% year-on-year. As we have seen in recent years, the amount of sucrose diverted to ethanol is expected to grow. Last season, 3.4mt of sucrose was diverted to ethanol production, whilst for this season 4.5mt of sucrose is expected to be diverted. This is a trend that will only grow in the years ahead given the government's ambitious plans to bring forward a 20% ethanol mandate from 2030 to 2025. For 2023, the government is targeting an ethanol blend of 12% in fuel. This move helps reduce India's import needs for oil whilst also dealing with persistent domestic sugar surpluses, which are largely due to government policy of fixing sugarcane prices for farmers.

Thai output continues its recovery

Thailand is expected to see sugar production in the current 2022/23 season increase by 3% YoY to 10.5mt. However, output is still expected to fall well short of the record 14.7mt produced back in the 2017/18 season. Thai output in recent years has suffered due to drought conditions but is slowly recovering. Planted area is still below levels seen prior to the drought years of 2019/20 and 2020/21. Higher fertiliser prices for much of this year have pushed farmers to plant more cassava instead of sugarcane, which is less fertiliser-intensive.

Tighter EU sugar market



Note: Output from 2020/21 onwards excludes the UK
Source: European Commission, ING Research

EU sugar market set to tighten

The European sugar market has seen significant strength in prices so far this year. According to data from the Europex`an Commission, prices in September averaged

EUR515/t. However, these prices are not a true reflection of spot prices. In fact, spot prices have been reported to be in excess of EUR1,000/t.

While EU sugar production in 2021/22 saw a recovery, the hot and dry summer seen across parts of Europe will have had an impact on the 2022/23 crop. European Commission data estimates that sugar yields will be down 3.4% YoY to 11.4t/ha while area is also expected to be down 4.3% YoY to 1.34m hectares. As a result, EU sugar production this season is estimated to total a little under 15.5mt, down almost 1.2mt YoY.

Assuming EU consumption in the region of 17.3mt, this does leave the region with a shortfall of a little more than 1.8mt. It is clear that the EU will need to meet this through a combination of stronger imports, weaker exports and the drawing down of inventory. The Commission estimates that stocks at the end of 2022/23 will total 1.3mt, which meets around 8% of annual demand, similar to levels that we have seen in recent seasons.

Given that EU spot prices are trading well above the world market, one may think that we would see a flooding of sugar into the EU. However, import duties on world market sugars are prohibitively high, which means we are not likely to see these flows. However, there is room for increased import volumes under current import quota programmes, which should prevent the EU market from getting significantly tighter. In addition, the large premium at which Europe is trading to the world market should limit EU sugar exports.

ING sugar price forecast

	1Q23	2Q23	3Q23	4Q23	FY23
ICE No.11 Sugar (USc/lb)	18.40	18.10	17.10	17.30	17.70

Source: ING research

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