METALS MARKET

2024 OUTLOOK

A market in full flux

February 2024

Completed on 25/01/2024

Ofi invest
Asset Management

2023 was a highly disappointing year for metals prices, due to sluggish economic activity and heavy inventories built up during the Covid crises. Paradoxically, it was also a boom year for the energy transition and its impact on demand for metals, in accordance with the scenario of disruption on this market.

There are two main reasons that prices of certain metals fell in 2023. First, metals consumption in developed economies was below normal, due to the impacts of higher interest rates and heavy manufacturer inventory drawdowns, which resulted in lower goods production and, hence, less consumption of resources.

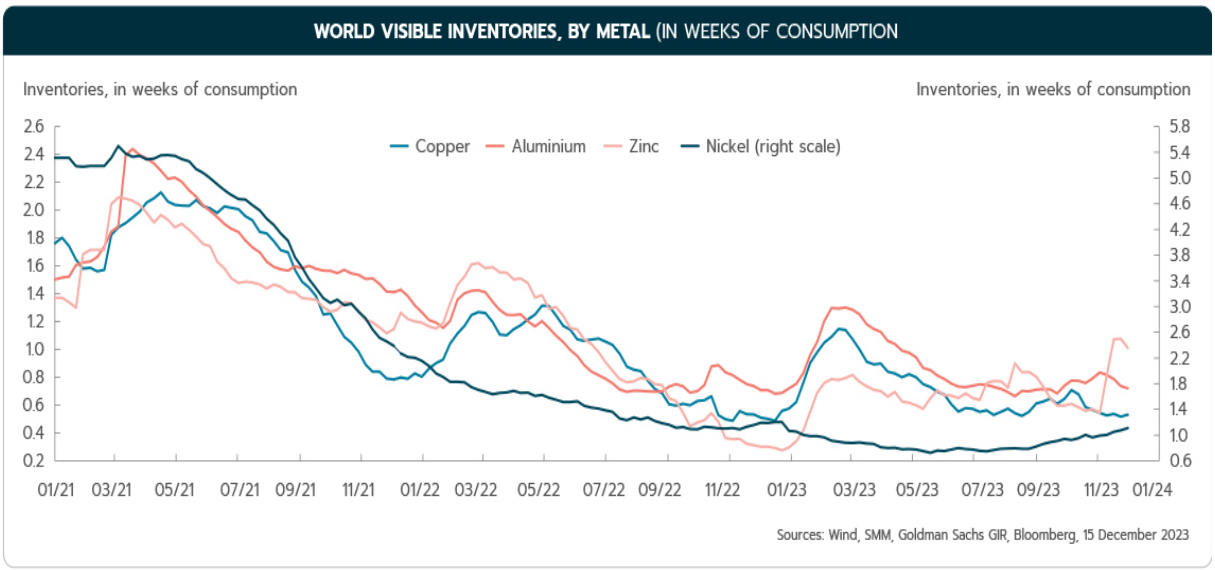
And, second, China began 2023 with very heavy metal inventories, as its "zero-Covid" policy of 2022 slowed demand while production held steady. And yet, Chinese metals consumption rebounded very sharply in 2023. Despite a severe real-estate slump, China's energy transition boom triggered a spectacular acceleration in new renewable energy installed capacities, in the roll-out of electrical grids and in new, lower-carbon forms of transports. This new source of metals consumption more than offset weak traditional demand. However, metals inventories that were far greater than normal early in the year helped absorb this demand, which therefore did not impact the end-market or truly support prices.

	YTD
Gold	7.14%
Silver	-5.29%
Palladium	-40.18%
Platinum	-9.15%
Aluminium	-6.19%
Copper	0.58%
Zinc	-11.14%
Nickel	-47.19%
Lead	-10.79%

Sources: Bloomberg, OFI Invest AM, December 2023

***The context is therefore looking brighter for metals in 2024**. First of all, metals inventories, in China and in the rest of the world, have been mostly used up by manufacturers. Inventories of reserves are historically low in China. The market is therefore likely to function more normally, in which demand for metals is unable to dip into inventories and accordingly impacts the international market and exerts upward pressure on prices.*

This advertising communication, which is intended exclusively for professional clients, contains information and figures that Ofi Invest Asset Management believes to be accurate at the time of preparation. The accuracy of the information and figures contained in this communication, taken from public sources, cannot be guaranteed. The analyses presented are based on assumptions and expectations made by Ofi Invest Asset Management at the time of writing, which may not be fully or partially realized in the markets. They do not constitute a commitment to profitability and are subject to change. The companies mentioned are for information purposes only. This is neither an offer to sell nor a solicitation to buy securities.



In China, real-estate activity is likely to remain sluggish. The sector is early in an in-depth restructuring process that could last several years. However, the government is attempting to support construction activity through targeted initiatives. Late last year, for example, it announced a three-pronged development package: construction of affordable housing, urban renewal, and an infrastructure plan. To finance it, it issued 1 trillion yuan (137 billion dollars) in bonds and raised its fiscal deficit objective from 3.0% of GDP in 2023 to 3.8% in 2024. This gradual stimulus, while still moderate, should therefore boost this sector. An infrastructure plan is also being launched. Disbursements and new projects are scheduled for the first months of 2024. Interestingly, whereas 2023 had begun with high investor expectations for China's reopening, hopes of an economic recovery are now very low. The metals markets have priced in a large number of negative factors and taken a clearly defensive posture. All of these signals are encouraging. In the short term, Chinese demand could be weak, as the period around the Chinese New Year (this year, 10 February) generally means less economic activity. The combined effects of the exhausting of inventories, robust energy transition momentum, and stimulus packages could begin showing up in March, exerting increasing upward pressure on the market.

In Europe and the US, the goods destocking cycle also appears to have run its course. Metals consumption should therefore gradually accelerate. The markets will also be driven by a more favourable monetary policy environment. The US Federal Reserve has served clear notice of the end of its tightening cycle and recently flagged its first rate cuts for 2024. This more accommodative context is likely to boost economic activity and, on the whole, become more favourable to commodities.

Lastly, 2023 was the year of a major disruption on the metals market – energy transition demand became significant and is now accounting for a rising proportion of demand.

The energy transition is now speeding ahead. Global annual new renewable installed capacities have risen by almost 50% to almost 510 gigawatts in 2023, the fastest pace of growth in the past two decades. This is the 22nd consecutive record-setting year for new renewable capacities. The increase in renewable capacities in Europe, the US and Brazil is at all-time highs, while the acceleration in China has been extraordinary.

In 2023, China brought 195 gigawatts of photovoltaic solar energy into service (as much as the entire world in 2022), plus 62 GW of wind power, or 257 gigawatts in all, vs. 136 gigawatts installed in 2022. The government of Xi Jinping is determined to move very fast in decarbonating its energy supplies and in promoting domestic champions in low-carbon technologies. In 2024, China is expected to set new records in new installed capacities: 277 additional gigawatts are planned in Chinese solar and wind power. Roll-out of electrical grids was also a major source of demand for copper and aluminium and will remain so in 2024, with China expected to invest 500 billion yuan, vs. 520 billion yuan in 2023.

This trend is likely to continue driving demand for metals and gradually reinforcing their resilience to economic cycles, as the energy transition is inevitable, regardless of the state of the economy.

Support for the metals market could also come from the supply side. Production is facing two major issues. On the one hand, political, social and environmental controversies have increased markedly in some countries, due to revenues of certain mining companies. In Chile, for example, large mines have been regularly brought to a halt by protests, which led to a drastic downward revision in annual copper production. Panama is another case, where a dispute between First Quantum Minerals[1] and the Panamanian government led to the closing, at least for the first half of 2024, of the Cobre Panama mine, which accounts for 1.5% of annual copper output.

[1] *Mentions of companies are for informational reasons only. They are neither an offer to sell, nor a solicitation to buy, securities.*

Meanwhile, margins are being squeezed at some mining companies. Operating costs have soared, including for energy and labour, while the steep drop in some metal prices has impacted results. As a result, more and more mining companies are operating at a loss and have announced, or are considering, shutdowns in production capacities. This is the case in particular for platinoids and nickel, where a large portion of producers are in negative cashflow at current prices. So, 2024 is likely to see new announcements of production cuts that will challenge the markets' supply/demand balance scenarios and impact metals prices.

Gold

Gold ended the year up by a little more than 7%.[2] In a challenging environment, it still ended the year close to its all-time highs. At first penalised by the direction of monetary policies, gold held up well because of a still-unsteady geopolitical situation.

As a non-yielding asset, gold has historically been penalised by rising yields of other assets. This is why Pimco describes gold as a long-duration asset, i.e., a 27-duration asset (i.e., a 1% shift in real interest rates triggers a 27% shift in gold in the opposite direction). With central banks having raised their interest rates at an unheard of pace and with inflation having trended upward, real interest rates rose past 2.5% during the year, whereas they were still in negative territory last year.

This should have caused a far greater drop in gold. However, in reaction to the ongoing conflict in Ukraine, Hamas's attack against Israel on 7 October, and increasingly tense Sino-US relations, investors wanted to keep some exposure to gold, which many of them regard as a safe haven. So, the correlation between gold and interest rates still seems to be valid, but the geopolitical premium has installed a higher base between the two markets.

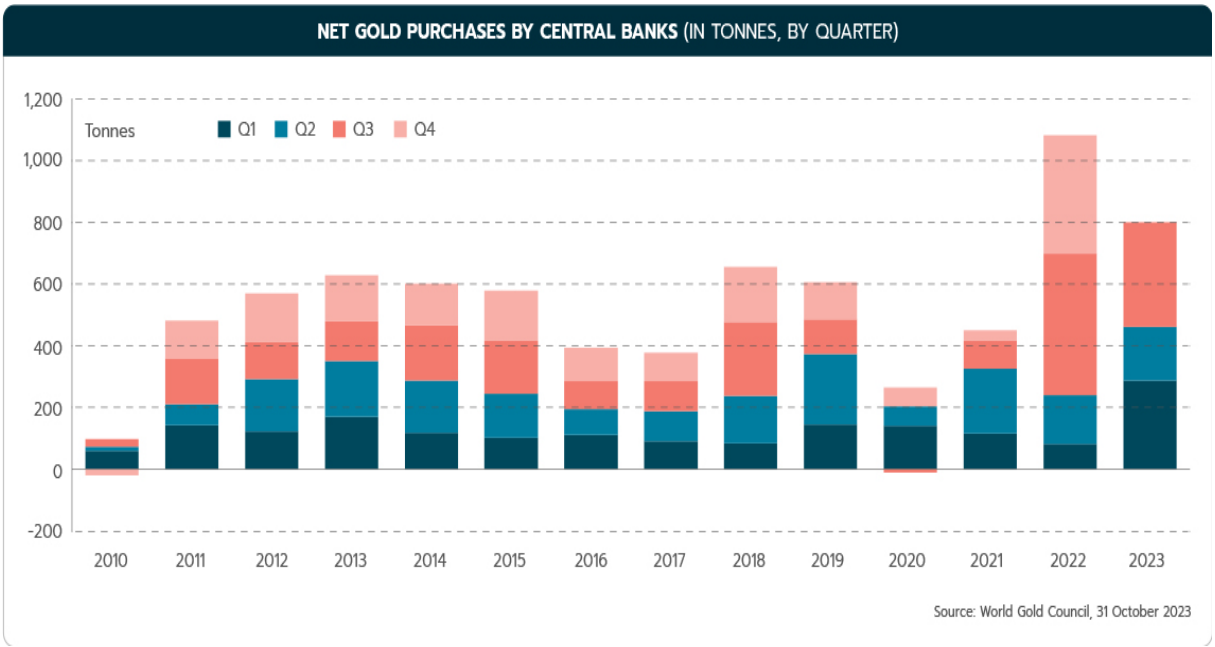
Some investors, moreover, are still concerned about the economic outlook. For, while central banks appear to be winning their anti-inflation fight, keep in mind that many inflation factors are due to supply-side issues and not demand-side ones. Inflation, in fact, was reined in only through demand destruction, which temporarily relieved supply-side constraints. But any reversal of monetary tightening will immediately bring back supply-side tensions. In other words, the only way that central banks can keep inflation down is to maintain a hawkish policy, at the risk of plunging the economy into a recession.

[2] *Past performances are not a reliable indicator of future performances.*

This is why scenarios for 2024 diverge so widely. Whereas some believe that monetary tightening will end up plunging the global economy into recession, others believe that the central banks, now close to their inflation targets, could once again become accommodative. Both of these scenarios are, paradoxically, favourable to gold. For, if central banks were to plunge economies into recession by sticking to their hawkish policies, the equity markets would fall, and investors would rediscover their appetite for safe havens, of which gold is widely considered to be one. Conversely, if central banks decided to ease monetary policy, real interest rates would move back down, which is the best scenario for gold.

The markets currently seem to have bought into the second assumption, and that is indeed the one that looks the most likely, given the uncomfortable posture the central banks now find themselves in. For, they are now caught between the rock of inflation, which forced them to tighten credit conditions, and the hard place of government debt, which exceeds 100% of GDP in most major economies, including China, Japan, US, France, and Italy. Raising interest rates places a huge burden on government finances. Debt servicing costs could thus exceed 1000 billion dollars in the US as early as next year and become the biggest line-item in the federal budget!

This perhaps explains central banks' own attitude towards gold. They have been regular buyers of gold for more than a decade now, but their net purchases have accelerated in recent months. After records of more than 600 tonnes in 2018 and 2019, the trend was broken off in 2020, as banks suspended their buying programmes to focus on managing the Covid crisis. But buying resumed in 2021, tentatively at first before accelerating in earnest in 2022 to set a record since 1967 at 1136 tonnes.



The trend spilled over into 2023, with confirmation of 800 tonnes bought in the first three quarters of the year. And judging by the statements of the central banks themselves, the trend is likely to continue in 2024. Fifty-seven central banks were surveyed by the World Gold Council (14 in developed countries and 43 in emerging market countries). 24% of them said they wanted to raise their gold allocations in the next 12 months. Only 3% said they wanted to reduce their positions.

The World Gold Council also asked central banks why they wanted to raise their exposures to the barbarous relic. The two most frequent responses were very telling. First, the central banks cited the lack of counterparty risk in gold, which says a lot about how these same establishments view government bonds, which constitute most of the rest of their holdings. They also said they wanted gold exposure as a hedge against real interest rates' staying low for a long time to come. Who better than central banks, which set monetary policies, to a have a clear view on future interest-rate trends?

Gold could accordingly benefit from the fact that real rates have probably, by the central banks' own admission, peaked and have already begun to pull back. Alongside the US dollar, this offers strong support for a trend increase in gold prices. Moreover, an easing in credit conditions could also restart inflation by once again squeezing supply.

Keep in mind also that 2024 will be one of the busiest electoral years in several decades, potentially with lots of uncertainties. Elections in Taiwan and the US will be closely watched. Any surprise in these elections, with their major geopolitical repercussions, could also push gold a little higher.

Lastly, it is worth pointing out that the 2023 gains were driven mainly by the return of professional investors. Holdings of ETFs, a product geared more towards private investors, have not yet turned upward and are still more than 600 tonnes below their mid-2022 levels (on an annual gold market of about 4500 tonnes). Gold could also be supported by the return of this category of investors to the demand side.

Based on the historical and rational relationship between real interest rates and gold, a correction of about 50 basis points in rates could send gold to new, all-time highs of between $2300 and $2400 per ounce.

Silver

Silver ended 2023 down by a little more than 5%.[3] Like gold, silver was mostly a victim of hawkish monetary policies and their negative impact on holding yield-free real assets.

And yet, the physical market remains tight, with a third consecutive year in deficit. In the past two years, the cumulative deficit now amounts to almost half of this year's mining output. However, worth noting is the fact that silver demand shrank this year, due to a marked decline in demand from the segments of jewellery, silverware and investment. This decline should be kept in perspective, as demand from these sectors merely returned to its 2021 levels, with 2022 having hit a high dating back at least the past decade. 2023 is therefore likely to have seen the second highest demand since 2013, despite a decline of about 10%.

On the supply side, mining output shrank by 2% in 2023 from one year earlier, as did global supply. Mining output is now almost 9% below its all-time high of 2016.

2024 is shaping up very well. In production, based on estimates by the largest producers, which historically are good indicators of global output, it is likely to remain tight. The collapse in silver prices a little more than a decade ago forced producers to downsize and exercise strict budgetary discipline. This is paying off today and will continue to do so for a long time to come, given the average time it takes to open up a new mine (17 years on average, according to the International Energy Agency (IEA). Mining output is therefore likely to change only slightly in 2024.

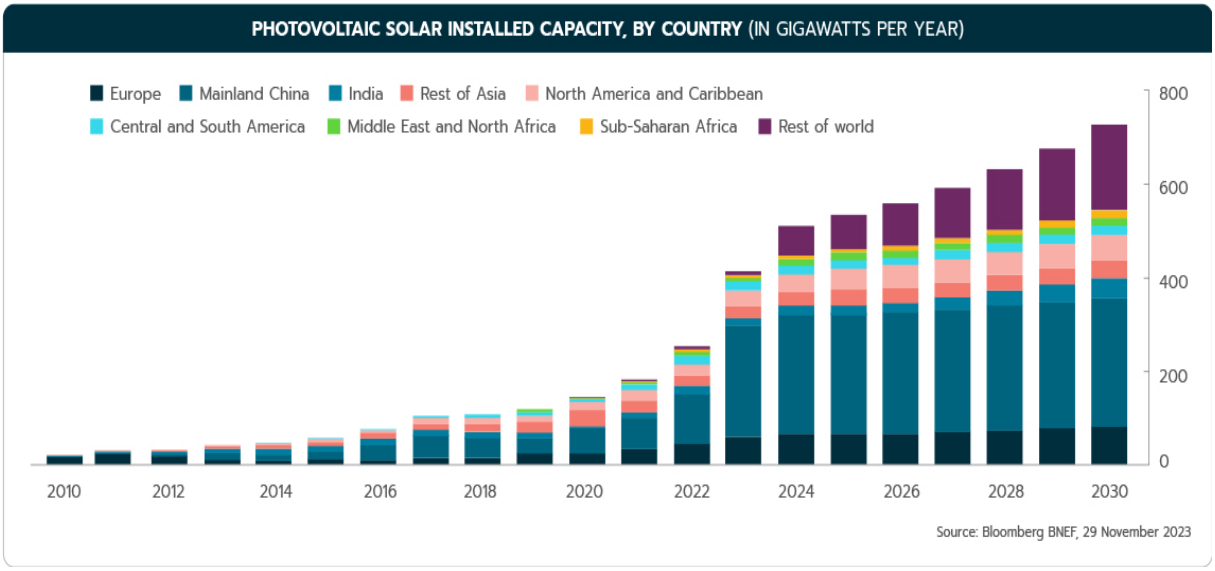
Industrial demand is likely to continue expanding, given silver's physical and chemical properties. As the metal that best conducts electricity, silver is used among other things in solar power to transport electrons in photovoltaic panels, as well as to make battery packs in electric vehicles (EVs).

With the development in the past decade of these two low-carbon technologies, which were almost non-existent 10 years ago, they now already account for more than 26% of global demand for silver. And this is no doubt just a start, for several reasons. First of all, after years during which solar panel producers have managed to reduce silver content in each panel (from 20-25 grammes in 2010 to about 5 grammes in the early 2020s), the latest panel technologies, TOPCon and heterojunction, require 1.3 to 1.8 times more silver than the current and widely dominant PERC technology (about

[3] *Past performances are not a reliable indicator of future performances.*

90% market share in installations). These new panels' market share is growing very fast, as they are 15% to 20% more efficient than a PERC panel.

Next, the roll-out of renewable energies has truly taken off. New installed capacities are likely to have set a record, according to the IEA, and to do so for the 22nd consecutive year. But 2023 was noteworthy mainly for its very sharp acceleration, with an almost 50% increase in installations from one year earlier, to 507 GW installed. China, in particular, installed as much solar capacity in 2023 as the rest of the world did in 2022! Meanwhile, photovoltaic solar has taken a big lead on other renewable technologies, with market share of 75%. The IEA also expects annual growth in installations to continue in coming years to as much as 750 to 950 GW annually by 2028, which works out to annual growth of 8.5% to 13.5% over the next five year! This could raise silver demand from the photovoltaic sector alone from about 16% today to 25% to 35% of global silver output by 2028.



There is also silver demand from the automotive sector. There again, demand is rising strongly, and prospects are good. Although, in the short term, the switch to a mass EV market is challenging and has caused automakers to lower their objectives, the movement has started and can only accelerate in the coming years. The market share for EVs should therefore quadruple by 2030. The chemical composition of batteries is still open to debate, but silver is not used in the battery itself, only in the battery pack, and such use has not been called into question.

Taken together, these two sectors, which did not exist a little more than a decade ago, could account for more than 50% of global silver demand by 2030!

In the shorter term, the ramp-up of these technologies is likely to ensure another deficit year in production vs. consumption in 2024 and boost the upside on silver

prices. In addition, there is the safe haven status that some investors attribute to silver. With monetary policies likely to become more accommodative and to shrink silver's disadvantage vs. yielding assets, silver could be bought heavily via financial products such as ETFs.

So, the outlook is very bright, in our view, and silver could therefore see gains of 15% to 25%, raising prices to between $28 and $30 per ounce by yearend.

Platinum

Platinoids went through an especially trying year in 2023. Weak industrial activity and the manufacturer destocking cycle drove down all industrial metals. But platinoids were also hit by the market's view that the growing popularity of EVs would soon evict other engine types and structurally reduce platinoid consumption. This expectation pushed market participants' net short positions to all-time records.

Platinum is less exposed than palladium to the auto industry, which accounts for 46% of its total consumption, vs. 80% for palladium. However, weak global demand and inventory drawdowns by consumers have pushed down prices. One reason: the pandemic and the resulting semiconductor shortage caused a drastic drop in vehicle production, with 30 million fewer units made from 2020 to 2022. Many automakers buy platinoids on the basis of annual contracts. This led to greater quantities of metals bought than used and an accumulation of inventories. Accordingly, in 2023, these same automakers were able to dial back their regular purchases in reaction to the platinum deficit. Surplus inventories accordingly made it possible to manage the recovery in demand as auto production moved back to normal. While it is hard to estimate when inventory drawdowns will end, data did show that inventories shrank in 2023. Consumers could therefore soon return to their customary buying habits. On a physical market in deficit in 2023 and expected to remain in deficit in 2024, this is likely to trigger a rally in platinum prices.

According to the World Platinum Investment Council, platinum is expected to be in deficit by 353,000 ounces in 2024, or 5% of demand. This deficit is not as wide as in 2023, as financial demand is expected to decline, but existing inventories have shrunk and will no longer be able to meet demand as they did in 2023.

Two other factors could shift the balance. First, production could very well be far more constrained than expected. In reaction to the very steep drop in platinoid prices in 2023, mining companies are now openly considering the restructuring of their non-

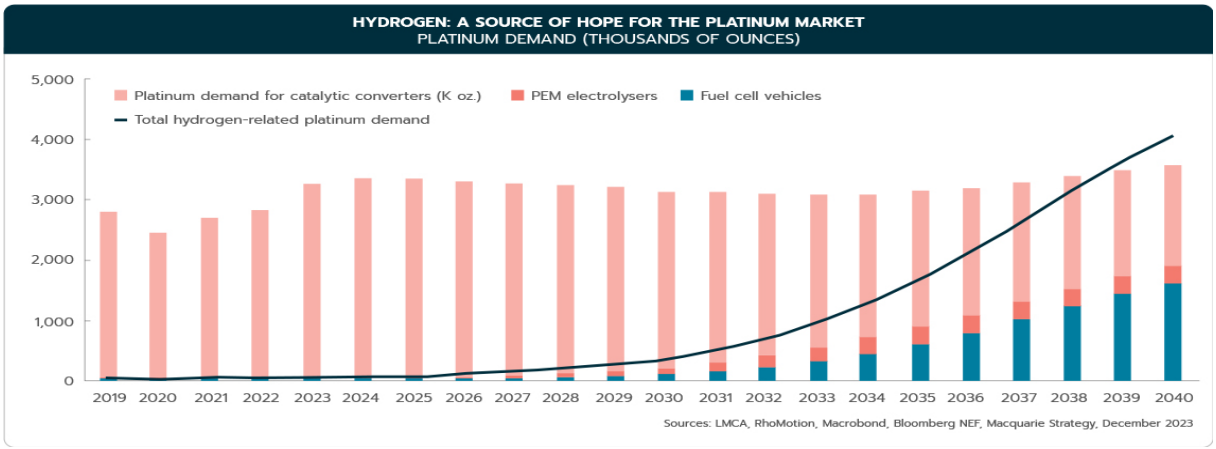
profitable activities or, at least, temporarily shutting down platinoid production capacities. The closing of just one or two non-profitable mines would be enough to shift platinum into steep deficit and would probably trigger a big rally in prices.

Three of the biggest platinoid-producing regions – in North America, Zimbabwe and South Africa – are burdened by relatively high production costs and are heavily exposed to a drop in prices of these metals. For example, we estimate that the margins of North American companies dropped by about 120% in 2023 and are now at about -120 per ounce[4].

Barring a rapid improvement in the situation, mining companies are likely to close some sites, given the losses caused by current prices for the basket of metals extracted at many of these mines. So, output could very well shrink as early as 2024.

A second factor could shift the balance. Current demand projections are based on known sources of demand for platinum. However, the boom in the hydrogen market could create a new, significant source of demand. Hydrogen currently accounts for 1% of platinum demand, and it is hard to chart its short-term prospects. Even so, huge investments by various countries, from China to the US to Europe and Japan, suggest that it will undergo rapid development in the coming years. Government investment in hydrogen soared from 50 billion dollars in 2021 to almost 300 billion dollars two years later, with projects set for deployment by 2030. The quest for energy independence, combined with the race for decarbonation suggests that hydrogen should continue to attract investment in the coming years.

This, of course, is potentially good news for platinum, which is needed to make fuel cells and proton exchange membrane (PEM) electrolysers, one of the two technologies used today in water electrolysis.



[4] *Source: Bank of America, As the world turns green, PYM industry margins turn red, 20 December 2023*

Apart from this new application, we expect platinum to remain necessary for many years to come for catalytic converters. Battery EVs are unlikely to constitute the sole mobility option for all uses in all parts of the world, any time soon. Hybrid vehicles, which are equipped with a larger catalytic converter than an internal combustion engine (ICE) vehicle, are therefore likely to continue to develop. Meanwhile, efforts are likely to continue to reduce particulate emissions from ICE vehicles. All these factors are likely to support platinum demand.

Palladium

Palladium had a very challenging year in 2023, with prices dropping by more than 40%.[5] After brushing up with its highs at more than $3000 per ounce in 2022 at the outbreak of the Russo-Ukrainian war (Russia is the largest producer of palladium), prices have been driven back down by the absence of international sanctions on metals from Russia.

Several other factors have driven prices down. First, some automakers have decided to replace palladium with platinum in making catalytic converters for ICE vehicles and hybrids. Given the price gap between the two metals, this made sense.

Second, palladium, like many other industrial metals, fell victim to a lack of interest from Chinese buyers. After China's decision to suspend its "zero-Covid" policy early in the year, Chinese companies, which do not receive the same level of assistance as Western companies, took a cautious stance by using inventories accumulated over the past two years before becoming buyers again.

Higher interest rates have also gradually chased financial actors from this market, and the poor outlook arising from expectations that ICEs will be phased out (the auto sector accounts for 80% of palladium consumption) have even pushed investors into record short positions on palladium.

Moreover, there are market rumours of heavy sales of palladium by the Russian sovereign-wealth fund. Unable to sell its gold on international markets because of sanctions levelled against it, the government of Vladimir Poutine has reportedly decided to sell some of its palladium inventories to finance the war. There is talk of sales exceeding 70 tonnes, on an annual market of 300 to 350 tonnes. This would have exerted heavy downward pressure on prices.

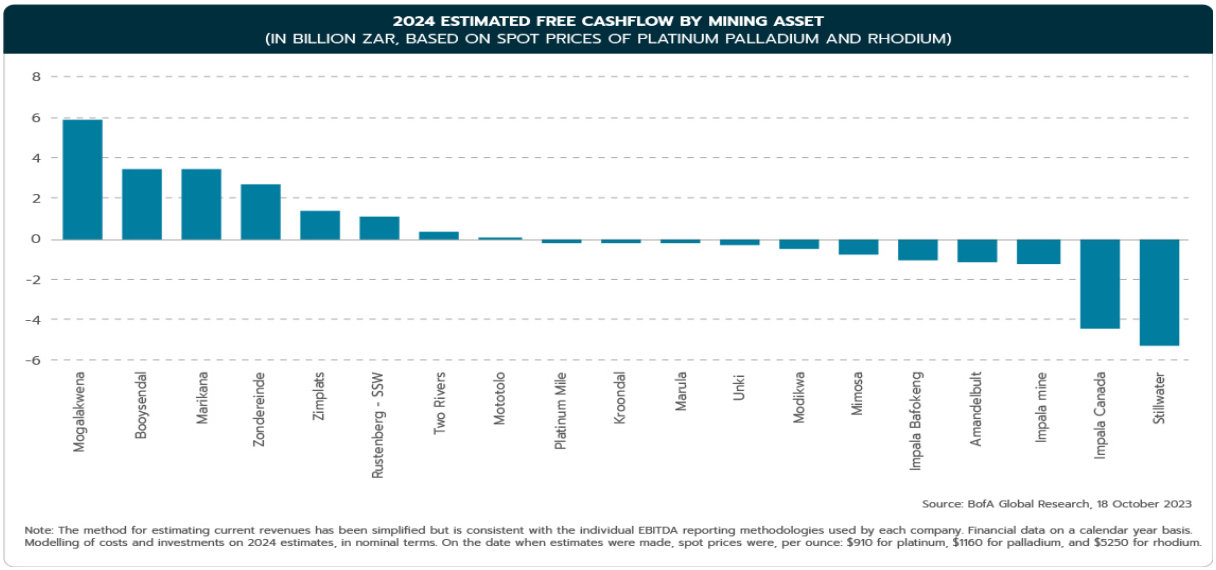
However, the outlook appears to have improved. First of all, the steep drop in palladium prices is making substitution by platinum less attractive. Substitution no

[5] *Past performances are not a reliable indicator of future performances.*

longer appears to be on the agenda, and some analysts have even reported an about-face by some automakers. So, the negative impact of the replacement of palladium is probably behind us.

Keep in mind also that while the switch to electric mobility is well under way, it is thus far less rapid than expected in 2050 zero-emission scenarios. Moreover, the high prices of EVs currently look like an obstacle to a switch. This is being seen in China, where hybrid vehicles, thus far ignored, now account for one third of EVs sold. This is important for the palladium market, as a hybrid vehicles still contain catalytic converters. They are even larger than in a conventional ICE vehicle and average 10% to 15% more platinoids than in an ICE vehicle.

On top of these energy transition issues, another opposing force likely to play a big part in 2024 is the impact of lower prices on mining company profitability. According to a Bank of America study, many South African and US palladium producers are currently in a negative free cash flows (FCF) situation. This could lead them to reduce their investments and production at some sites, thus constraining global supply.



Falling palladium prices have also had an impact on palladium output on the secondary market, i.e., from recycling. The steep price drops of recent months have made recycling less and less cost-effective, and recycled volumes are likely to stall in 2024.

Lastly, Russia appears to have halted its palladium sales after depleting its inventories. Meanwhile, financial investors are no longer increasing their short palladium positions. They may even unwind these positions as soon as monetary policies become more accommodative.

The entire trend in 2023 looks overdone. Remember that it occurred on a market that ended the year in a deficit of production vs. consumption. Incidentally, this is likely to

be the case again in 2024, according to Norilsk Nickel[6], the world's largest palladium maker. Norilsk projects a deficit of 6 to 25 tonnes, or 2% to 8% of annual output.

Palladium could thus rally in 2024. Given the medium-term outlook, it is unlikely to return to levels seen early last year. Prices could nonetheless return to $1400 to $1500 per ounce.

Copper

Copper is one of the few industrial metals to end 2023 in positive territory. It, too, was hit by Chinese destocking, like many other metals, and by the global slowdown of the industrial sector and the real-estate slump in China, but prices held up, given copper's importance to all low-carbon technologies.

Copper is the "jack-of-all-trades" of the energy transition. Essential to wind turbines (which require 950 kilos to 5 tonnes of copper, depending on the turbine's size), it is also used massively in electric mobility (there is four times as much copper in an EV than in an ICE car), in solar power (for grid connections and busbars), and elsewhere. It is also essential for expanding the grids, which this year took their rightful place as an essential, albeit overlooked, link in a successful energy transition. Until then, grid needs brought on by the expansion of renewable energies had been underestimated by far. The IEA pointed out just recently, for example, that renewable energy capacities connected to the grid in 2022 in the US had already been completed in 2017! In France, even with its dense grid, a project in Charente-Maritime is still waiting, as the connection deadline announced to the developer is... eight years!

On the demand side, the monetary easing begun 18 months ago in all developed economies has squeezed industrial activity and, in turn, driven down demand for metals. Higher interest rates undermined manufacturing growth in both Europe, where economic activity has contracted for 18 months, and in the US, where manufacturing has been shrinking for 13 months. Even in China, manufacturing activity has shrunk in seven of the past eight months.

Two factors nonetheless helped copper hold up this year. First, while Chinese real-estate activity was also in a deep slump, the government has taken measures aiming mainly at supporting the completion of buildings under construction. And it is during

[6] *Mentions of companies are for informational reasons only. They are neither an offer to sell, nor a solicitation to buy securities.*

this phase that consumption of metals, copper in particular, is the heaviest. This has helped stem the decline in demand from this sector.

But the decisive factor was the brisk acceleration in rolling out low-carbon technologies, in China and elsewhere! New global installed renewable energy capacities rose by almost 50% year-on-year to almost 510 GW, generating heavy needs for metals. China also accelerated the expansion of its electrical grids, investing about 520 billion yuan (almost 73 billion dollars). And the government has also provided strong support to electric mobility: EV sales are expected to rise by 22% on the year and hybrid vehicle sales by 83%!

Total copper demand thus rose by 4% worldwide, and by 9.5% in China, in the first 10 months of the year! And even without a positive base effect, as copper demand was also up in 2022.

This confirms that ongoing transformations are lessening the elasticity of demand for metals, copper in particular, to traditional economic cycles. The acceleration of the energy transition, which is inevitable regardless of the economic cycle, has generated additional demand for metals that more than offsets declining consumption from traditional sectors, which are in a moderate slowdown.

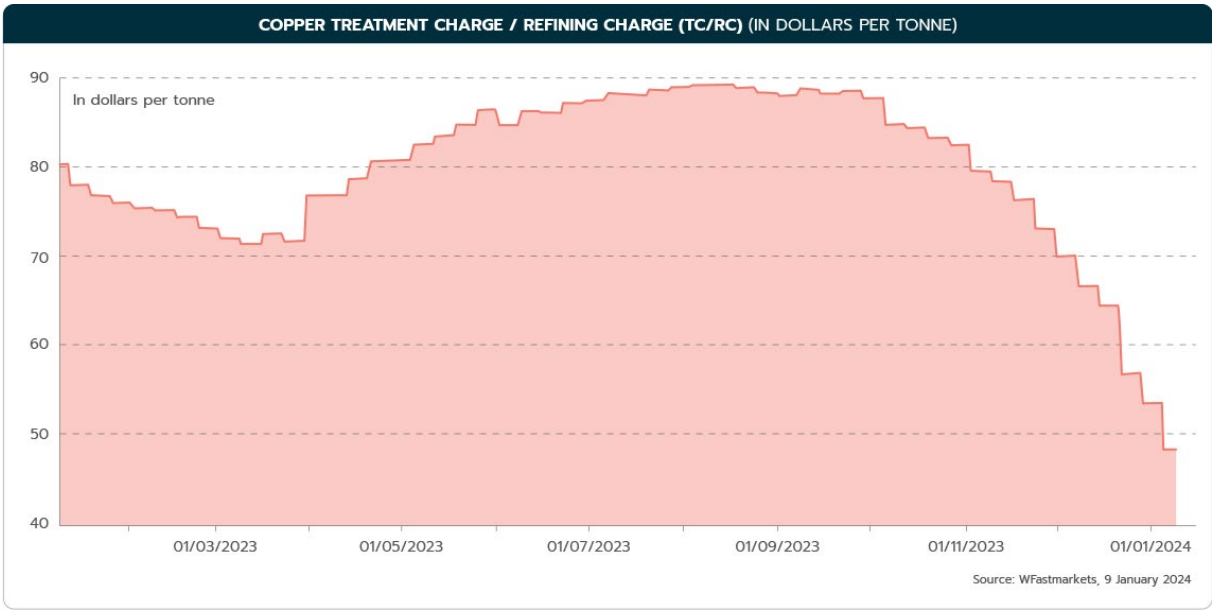
On the supply side, inventories accumulated by China throughout the Covid crisis helped meet this additional demand during most of the year. So, while there was indeed a decorrelation between economic cycles and metal demand, this was only partly the case for copper prices, which were able only to remain stable. China, the world's biggest buyer of metals, did indeed rely on its inventories and was therefore absent from demand during an entire portion of the year.

Inventories are back to very low levels, and constraints have recently re-emerged. Mining output did expand in 2023 but by just 1% in the first 10 months of the year, according to the International Copper Study Group, despite the opening up of new capacities. This was due to halts in production in Chile, Indonesia, Panama and the US in the first half of the year. But problems persisted thereafter in Panama and Chile and emerged in Peru in the second half of the year. In Panama, the government even declared the operating contract with First Quantum Minerals[7] for the Cobre Panama mine to be unconstitutional. Cobre Panama, which accounts for about 1.5% of global copper output, is therefore expected to remain closed at least until the next presidential elections in Panama, scheduled for May 2024. In Peru, local communities' anti-mining protests are causing halts in production processes. And in Chile, mining

[7] *Mentions of companies are for informational reasons only. They are neither an offer to sell, nor a solicitation to buy securities.*

companies face geological and political issues. Anglo American, for example, had to lower its production targets for 2024 and the two following years, owing to lower ore content than expected and to very hard rocks that raised operating costs. Codelco, the national company, saw its production fall to a quarter-century low after setbacks on a number of projects that were unable to reestablish ore content after decades of under-investment.

These mining output challenges are beginning to show up clearly on the demand side of the physical market. Refiners, who must obtain copper concentrate to work, are having a harder and harder time sourcing. This has cut into their margins, called "TC/RC" (Treatment charge / Refining charge). In just a few months, margins have been almost halved and in January 2024 fell below $50 per tonne, a low since July 2021!



Lack of availability of copper concentrate has also led China to expand its purchases of already refined copper, in cathode form. As of the end of December, we did not yet have figures for the four previous months, but China did import more refined copper than the surplus available on the ex China market.

All these factors are providing strong support for copper. However, the start of the year is historically a period of inventory build-up, due to slower activity in China. The Chinese New Year, which this year is on 10 February, is the occasion of a two-week holiday period, during which the economy moves in slow-motion.

Once the New Year period is over, we are likely to see Chinese demand take off again, as the government has announced further deployment of low-carbon technologies. Electrical grids, for example will see an investment of 500 billion yuan (70 billion dollars, in line with 2023 investments). New renewable energy installed

capacities (solar and wind power) are expected to reach 277 GW, or almost as much as the world in...2022! And electric mobility could expand by 20% vs. 2023, with almost 10 million EVs sold, according to BloombergNEF. The rest of the world is likely to follow suit, given that the IEA expects global installed capacities of renewables to expand by at least 8%, and BloombergNEF forecasts a 20% increase in EVs.

In addition, an easing in monetary policies is expected in the main developed economies. The end of the tightening cycle and the likely cuts in rates should allow manufacturing indicators to recover in the second half of the year. This is likely to send the copper market into deficit, thus pushing prices up.

All told, we believe copper prices could rise by about 15%, to $10,000 per tonne, but in the second half of the year.

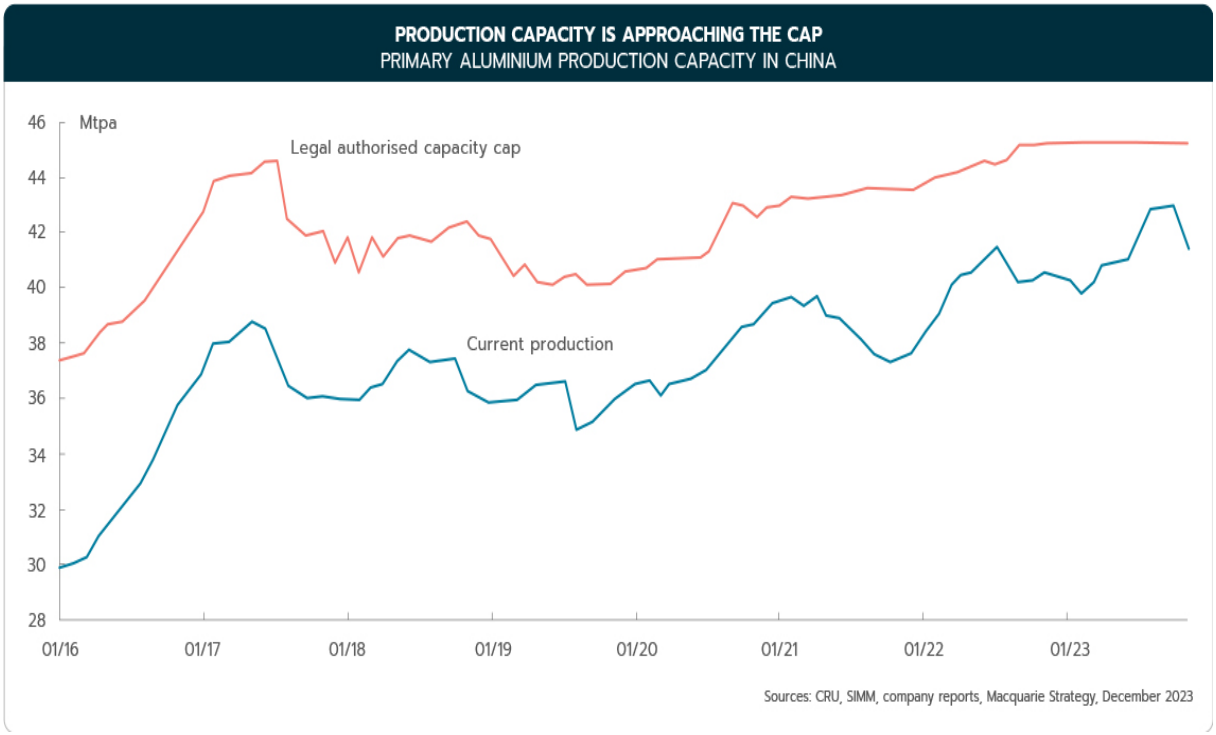
Aluminium

In 2023, aluminium, like all base metals, suffered from a combination of weak industrial demand, especially in Europe and the US, and inventory drawdowns that were especially pronounced early in the year. In Asia, demand was more robust, thanks mainly to the steep rise in demand from decarbonated technologies and electrical grids. But that demand was met easily with existing inventories. Things are likely to change in 2024, leading to a significantly tighter market.

For example, constraints on aluminium production are intensifying. In recent years, China has become one of the world's largest aluminium producers. From 38.5 million tonnes in 2021, production rose to 40.2 million tonnes in 2022, and 43 million tonnes in 2023, out of global output of about 70 million tonnes. This market domination is due mainly to soaring domestic consumption of aluminium. In addition to demand from industry and real estate, aluminium has a multitude of new applications, from EVs to renewable energies, to the electrical cables needed for expanding the grids. With this in mind, and despite the real-estate slump and the general sluggishness in Chinese economic activity, domestic consumption rose by 5%, as the acceleration in the energy transition more than offset weakness in traditional demand. To cite just one example, China's solar power boom alone caused additional aluminium demand of 1.6 million tonnes in 2023, or 2.3% of global annual output.

However, production seems to have peaked. Anti-pollution measures decreed by the government of Xi Jinping require reducing energy-intensive activities, particularly in regions where the energy comes from coal-fired power plants. Aluminium-producing

regions are concerned by this situation. Meanwhile, recurring droughts in recent years has placed more stringent constraints on electricity generation from huge dams like Yunnan. This has led the authorities to ration electricity. All this has led the government to decree an annual cap on aluminium output of 45 million tonnes per an. This cap is on the verge of being met, as all aluminium produced was consumed domestically in recent months, despite rather moderate industrial activity. Any additional expansion in consumption, likely to be driven mainly by the ongoing energy transition, will have to be addressed by other sources of production, thus stoking international competition to supply China with aluminium.



In Europe, production is also constrained. In 2022, soaring energy costs had already forced producers to close numerous refineries and foundries. Although the crisis has receded somewhat, refiners continue to lose money. Far from having been resolved, the situation could get even worse, with closures of other production sites in Europe.

Similar discussions are being conducted in the US on shutting down capacities. The main US aluminium maker, Alcoa[8], has confirmed its plans this year to shut down its Kwinana refinery completely in order to cut costs. It announced it would begin to reduce its output in the second quarter and to shut it down fully in the third quarter. This refinery's production capacity of about 2.2 million tonnes of alumina accounts for about 1.2% of global output. So, there are more and more production capacity cuts in the pipeline.

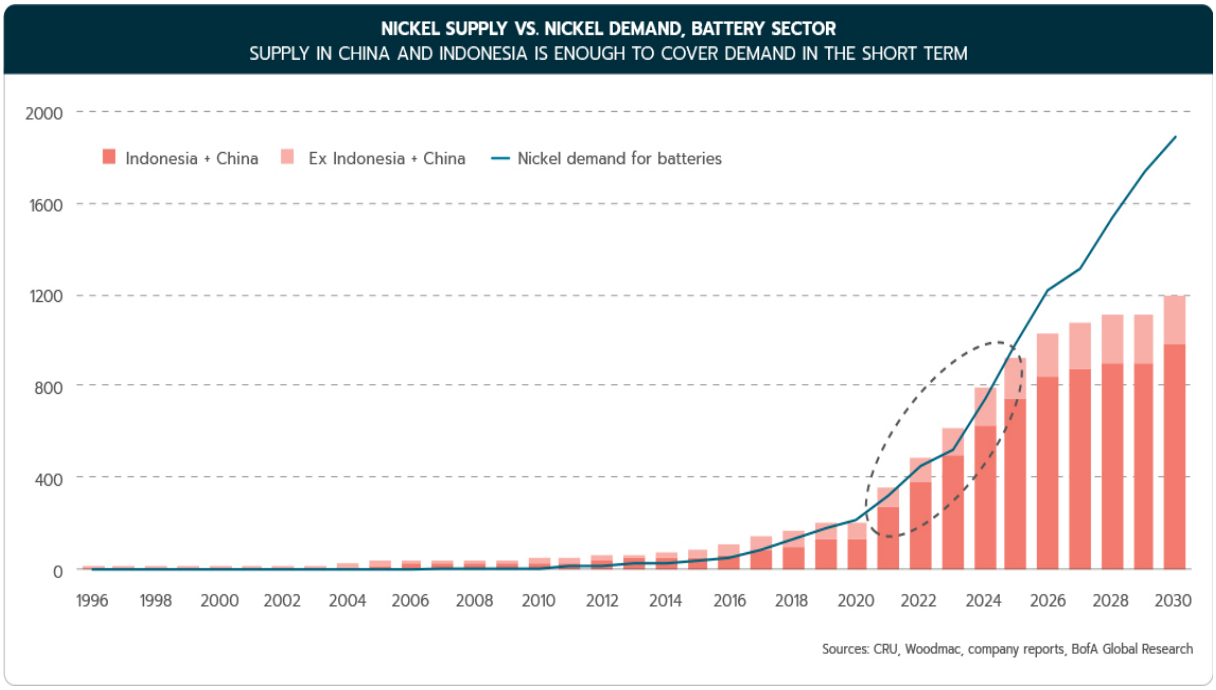
[8] *Mentions of companies are for informational reasons only. They are neither an offer to sell, nor a solicitation to buy securities.*

Chinese demand is likely to continue expanding robustly, driven by a rapid pace of installation of decarbonated technologies, by a massive infrastructure plan, and by the urban renovation projects launched by the government late last year. Ex China demand is likely to gradually recover after a tough year and an outsized cycle of inventory drawdown of manufactured goods.

The aluminium market is therefore likely to tighten gradually, and competition is likely to become keener between various consumers, in a globally constrained production environment. With aluminium inventories low and in anticipation of a significant supply-demand deficit for 2024, prices are likely to rise in the coming months.

Nickel

The nickel market had already begun to weaken in early 2023, when China and Indonesia announced new, significant production capacities. A new chemical process has been developed that can transform lower-quality materials into very pure (class 1) nickel, which can be used in EV batteries. This process has opened the door to production of class 1 nickel on a larger scale, using relatively abundant materials like nickel pig iron (NPI), a sort of ferronickel normally used only to make galvanised steel, or matte, an intermediate product containing 30% to 60% nickel. As a result, the normally tight market for class 1 nickel has become better supplied, triggering a drop in prices.



2023 was also marked by less consumption than expected of nickel for making batteries, due in part to destocking on the supply chain amidst falling prices and rising interest rates, as well as a steep decline in the market share of zinc-free lithium-iron-phosphate (LIP) batteries in China. China was not only the biggest producer and the biggest buyer of EVs, but also the main driver of growth in sales of EVs in 2023. As a result, despite global growth of 30% of global EV sales, nickel consumption from this sector rose only moderately and not at all in China.

These phenomena gave rise to surplus supply of about 320,000 tonnes of nickel, and, in turn, to a steep drop in prices in 2023.

Production using these new chemical treatments in Indonesia and China is likely to continue supplying the nickel market and in 2024 could once again cause significant oversupply, which would slow nickel's short-term potential. However, recent price declines have squeezed producer margins considerably. More and more mining companies are in negative cashflow situations on their nickel production, and that is beginning to show up in the first shutdowns in capacities.

For example, First Quantum has announced the shutdown of the Ravensthorpe nickel and cobalt mine in Australia for the next two years. First Quantum made this decision as operating the site generated a loss of 66 million dollars in the first nine months of 2023. As a major portion of the sector continues to suffer losses at current levels, the surplus expected by the market is likely to gradually bring on closures of production capacities at sites at which margins have become negative.

On the demand side, although growth has weakened in the short term, we expect the EV battery sector to once again become quickly the main driver of growth. Use of nickel in batteries rose sharply in 2022, by about 480,000, with China accounting for 80% of this new demand. In 2023, demand increased by just 20,000 tonnes, due mainly to the destocking cycle on the entire nickel market.

However, nickel demand is likely to rebound in 2024, driven in large part by batteries. The worldwide expansion in EVs should remain a source of metals consumption, with robust growth from year to year. Moreover, although nickel-free lithium-iron-phosphate (LFP) batteries are booming, this is also the case of batteries with high nickel content (up to 90%). These batteries meet the need of some consumers to drive longer distances without recharging their vehicle, something that isn't possible with LFP technology. They also offer very low recharging times and far greater energy density, making them the go-to technology for some market segments. Nickel should therefore continue to play a big role in battery composition.

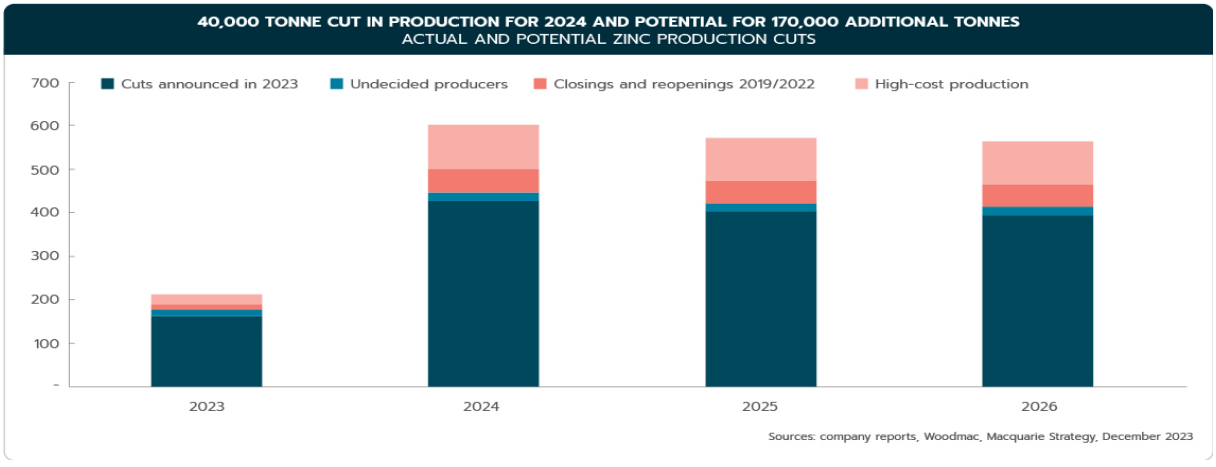
Zinc

Zinc was not spared by weak industrial demand or by heavy inventories early in the year, which led to massive destocking. Zinc prices fell mainly in the first half of the year, from almost 3000 dollars per tonne at end-December 2022 to 2250 dollars at the end of May. They then began to level off, before moving back up and retracing more than half of its previous correction.

This support comes in part from a cutback in production by some mining companies. Beginning in mid-year, mining was suspended at Tara in Ireland, Aljustrel in Portugal and two Nyrstar[9] mines in the US, due to low zinc prices and higher production costs. These suspensions pulled a total of 250,000 tonnes of zinc off the global market.

In parallel, Chinese demand for zinc was especially robust, rising by 7% from January and October 2023, compared to the same period one year earlier. Keep in mind that this increase was not due to a negative base effect: despite the "zero-Covid" policy set up in 2022, zinc consumption in China rose slightly. In addition to demand for zinc and galvanised steel from the construction sector, and the final push to complete building sites, zinc was also in heavy demand in some low-carbon technologies. Wind turbines and solar panels require zinc-containing coatings to prevent corrosion. These fast-growing sectors are a new source of demand for this market.

Because of both production cuts and robust demand from China, the surplus supply projected for 2023 shrank considerably. For 2024, the market is still expecting a slight surplus, as demand from Western countries remains low. However, new mining suspensions are possible. Production on this market is highly price-sensitive, and any new price correction would no doubt trigger other closures. They could even happen if prices remain close to their current levels.



[9] *Mentions of companies are for informational reasons only. They are neither an offer to sell, nor a solicitation to buy securities.*

Zinc price trends thus seem to be capped by the receding in supply-side threats, while energy transition demand is increasing. Zinc prices are therefore likely to stabilise before rising slowly in 2024.

Lead

The lead market shrank by about 10% in 2023[10], hit, like other metals, by inventory drawdowns in China. Mining output of lead was almost unchanged, rising by 0.3% this year, with supply growth from new projects (Zhairem and Abra) having been mostly cancelled out by declines in Mexico (due to strike at the Peñasquito mine), China (flooding) and Australia. Production is expected to rise further in 2024 with the start-up of new projects and level off slightly below 3% growth. But most sourcing will, in reality, be on the secondary market, as battery recycling accounts for almost 70% of global supply.

On the demand side, consumption from the auto sector, whether in OEM or replacement parts, still accounts for most demand, with market share of about 65%. The market has been supported by the slow recovery in the auto sector since the Covid crisis ended.

But potential looks limited. More and more EV makers no longer use lead batteries, preferring lithium batteries even for "ancillary" functions, whereas the e-bike market, which was another source of expansion, is maturing and is also switching increasingly to lithium batteries. Development hopes for lead are mainly from stationary storage in batteries, for which lithium batteries are not always the best option, and from future demand for installing subsea cables needed for offshore wind turbines, as lead doubles the lifespan of cables compared to a conventional cable.

But offshore wind power is facing many challenges, and projects have been delayed this year, with several developers preferring to pay a penalty for walking away from a project rather than go ahead with an economically non-viable one.

As long as the stationary storage and offshore wind power sectors have not truly taken off, lead's potential may remain limited. On the other hand, as most supply is from recycling, prices are unlikely to suffer steep drops, as that would automatically cause a decline in secondary supply. Lead prices are therefore likely to trade within a rather narrow range of $1900 to $2300 per tonne.

[10] *Past performances are not a reliable indicator of future performances.*

Conclusion

The metals market is currently in full flux, due to new demand generated by the energy transition. In stoking fast-growing demand that is uncorrelated to economic cycles (due to the need to accelerate the development of low-carbon energies), the energy transition is creating inelasticity of metals demand to shifts in traditional sectors. This was confirmed in 2023 in China and the rest of the world. However, this has not shown up in prices, as China, the world's largest metals buyer with a share of about 50% of all metals, drew down the inventories of commodities that it had built up during the pandemic.

But now, with inventories now at historically low levels and as growth is likely to continue in renewable energies, electric mobility and electrical grids, China is likely to return to the physical market and allow metals prices to track demand upward. For some metals, such as copper, the imbalance between rising demand and still-constrained supply is likely to lead gradually to a situation in which higher prices will be the only way to prevent a deficit in resources. Let's not overlook the fact that a commodities market cannot be in deficit once inventories have been drawn down. After all, we can't produce a commodity that we haven't yet produced!

Given the degree of maturity of the various low-carbon technologies, the market should become tighter at various times, depending on the metals. Copper, aluminium and silver currently look like the metals with the most upside potential in the short and medium term. Nickel, platinum, zinc and lead could take longer before demand materialises or supply stabilises. Palladium could rally in the short term, given how much the physical market seems to be at odds with the collapse in prices. But it will have to find new applications if it wants to keep investors interested over the longer term.

Gold is on the margins, as for the moment it has only an anecdotal role to play in the energy transition. But in an increasingly uncertain geopolitical context, and as central banks are most likely to return to more accommodative monetary policies, gold could rapidly return to investor favour and push last year's momentum into 2024.

IMPORTANT NOTICE

This 2023 Review and 2024 Outlook have been produced by Ofi Invest Asset Management, a portfolio management firm (APE n°: 6630Z) governed by French law and certified by the French Financial Markets Authority (Autorité des Marchés Financiers, AMF) under n° GP 92-12 – FR 51384940342. Ofi Invest Asset Management is a Société Anonyme à Conseil d'Administration [joint-stock company with a board of directors] with authorized capital of 71,957,490 euros and head offices located at 22, rue Vernier 75017 Paris, France. It is entered into the Paris Registry of Trade and Companies under n° 384 940 342.

This document contains information and quantified data that Ofi Invest Asset Management regards as well-founded or accurate on the day on which they were produced. Regarding information and quantified data from public sources, no guarantee is offered with regards to their accuracy.

The analyses presented herein are based on the assumptions and expectations of Ofi Invest Asset Management at the moment in which this document was produced. Such assumptions and expectations may or may not prove to be true on the markets, in whole or in part. They do not constitute a commitment to profitability and are subject to modification.

They offer no assurance that the products or services presented herein and managed by Ofi Invest Asset Management will be suited to the investor's financial standing, risk profile, or experience and do not constitute a recommendation, advice or an offer to buy the financial product mentioned herein. Ofi Invest Asset Management may not be held liable for any damage or losses resulting from the use of all or part of the information provided herein. Before investing in any fund, all investors are strongly urged to undertake an analysis of their personal situation, and of benefits and risks, in order to determine the amount that is reasonable to invest, without basing themselves exclusively on the information provided in this promotional document. FA24/0020/24072024