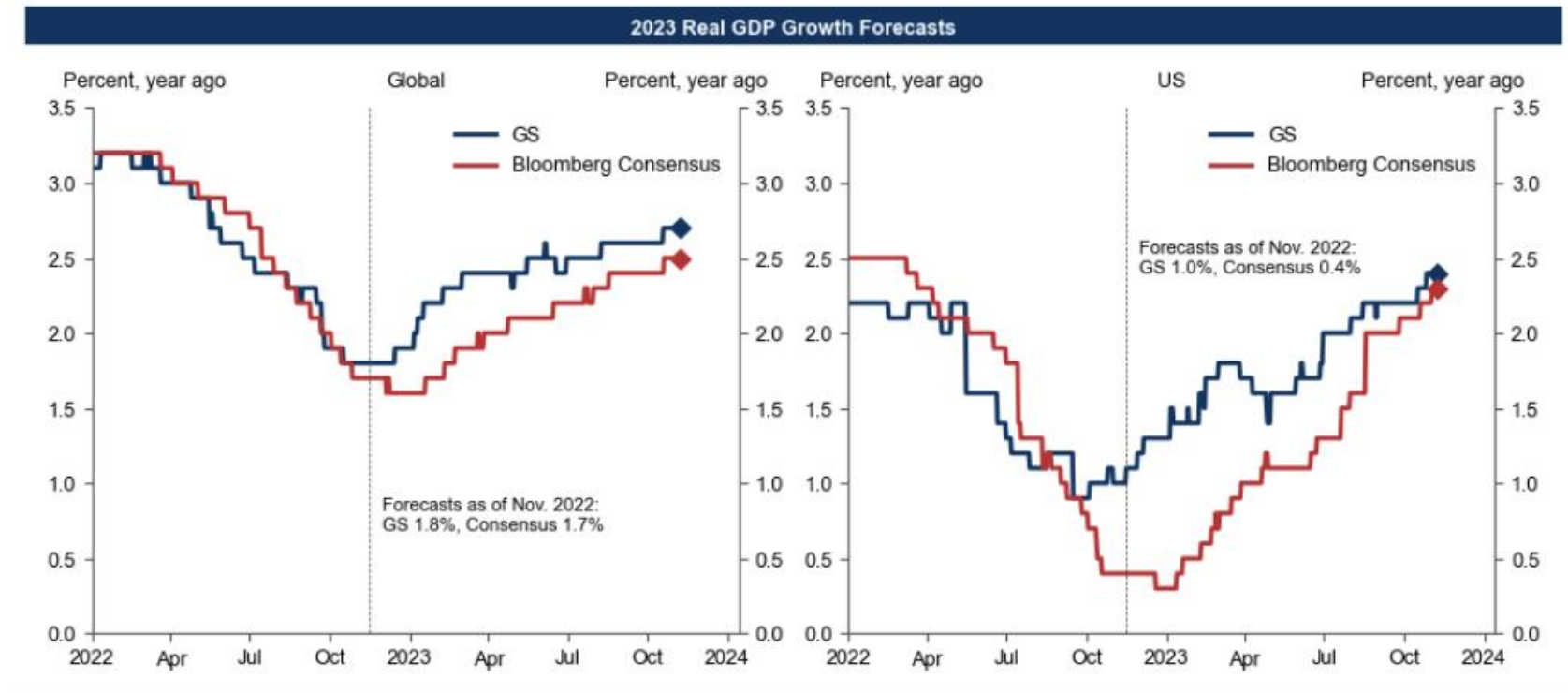


GLOBAL ECONOMY and GRAPHITE ELECTRODE INDUSTRY October 2023 & OUTLOOK 2024

13 November 2023

The global economy has outperformed even our optimistic expectations in 2023



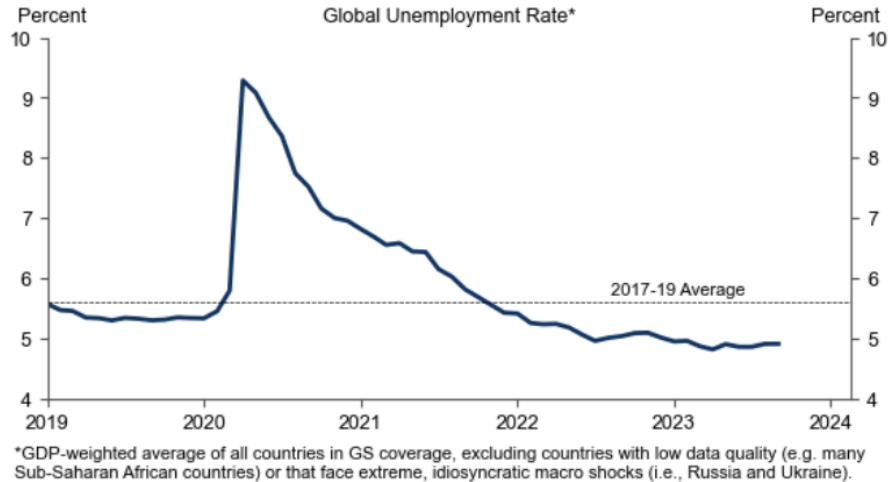
Source: Bloomberg, Goldman Sachs Global Investment Research

Source: <https://www.goldmansachs.com/>

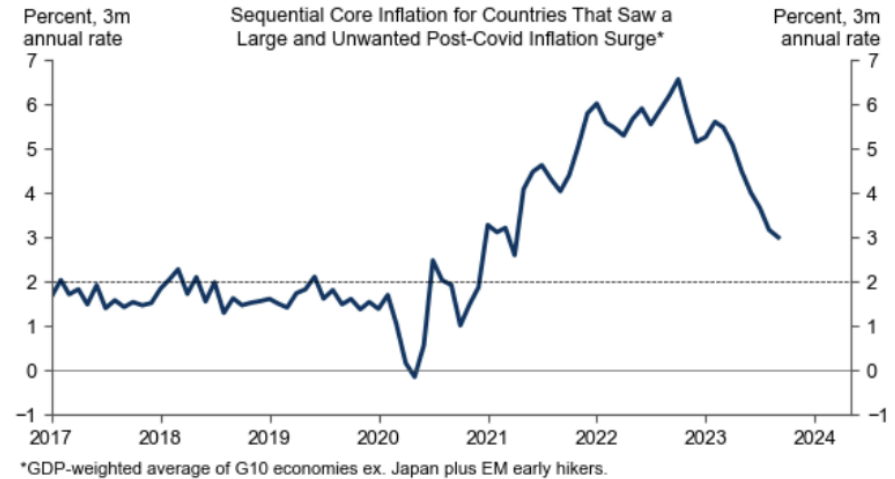
Macro Outlook 2024: The Hard Part Is Over



The global economy has outperformed even our optimistic expectations in 2023



Source: Haver Analytics, Goldman Sachs Global Investment Research



Source: Haver Analytics, Goldman Sachs Global Investment Research

Unemployment Has Settled Below Pre-Pandemic Levels

A Sharp Drop in Core Inflation Across the Economies That Saw a Post-Pandemic Surge

- Unemployment rate across all economies that produce high-quality labor market data continued to edge down in 2022-2023
- This improvement is visible even in some key economies that have seen very low real GDP growth, such as the Euro area

Source: <https://www.goldmansachs.com/>



The positive surprises in the global; economy despite several unexpected negative shocks are:

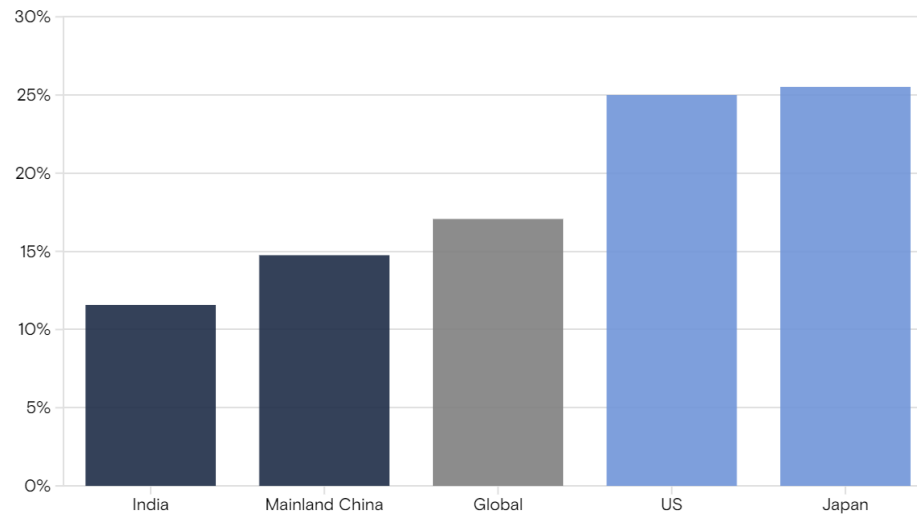
1. Both short-term and long-term interest rates rose significantly further than implied by market pricing—partly due to better-than-expected growth data but also partly due to more hawkish central bank reaction functions
2. There was a serious but brief bout of banking sector instability in the US and Europe during the spring
3. The Middle East unrest though there are security risks facing the world, so far has not had a major impact on oil prices, financial markets, or the real economy outside the Middle East

Source: <https://www.goldmansachs.com/>





- Generative AI has the potential to automate many work tasks and eventually boost global economic growth
- AI will start having a measurable impact on US GDP in 2027
- Growth through AI in other economies around the world in the years that follow
- AI could ultimately automate around 25% of labor tasks in advanced economies and 10-20% of work in emerging economies



Source: <https://www.goldmansachs.com/>





- Goldman Sachs estimates a growth boost to GDP from AI of 0.4% in the US
- 0.3% on average in other Developed Markets
- 0.2% on average in advanced Emerging Markets by 2034
- In other emerging markets, a smaller boost from AI given adoption will probably take longer and AI exposure will likely be lower

Source: <https://www.goldmansachs.com/>





How much can AI improve productivity?

- In the baseline scenario, AI could increase US productivity growth by 1.5% annually assuming widespread adoption over a 10-year period.
- They expect similar effects in other major developed markets
- A somewhat smaller impact of 0.7-1.3% in most emerging economies given their:
 - higher share of employment in sectors
 - Low AI exposure in agriculture and construction.

Source: <https://www.goldmansachs.com/>





- AI's effects on GDP will take time to emerge
- Surveys indicate:
 - A small impact from AI on activity and hiring needs in the next 1-3 years
 - A much larger impact in the next 3-10 years

Source: <https://www.goldmansachs.com/>





Brent crude futures climbed nearly 2% to \$81.5 per barrel, as the financial market rebounded from hawkish Federal Reserve comments, but were still on track for a third consecutive weekly decline. Concerns about potential supply disruptions in the Middle East, coupled with uncertainties in US and Chinese demand, contributed to the week's downward pressure



Source: <https://www.tradingeconomics.com>



Iron Ore Price- 63.5% iron content



Prices for 63.5% iron ore content for delivery in Tianjin advanced to \$130/MT, the highest in over 7 months, amid expectations of robust demand and risks to supply. China would accelerate the issuance of bonds after accommodating an additional CNY 1 trillion in debt to target steel-heavy infrastructure and manufacturing projects.



Source: <https://www.tradingeconomics.com>



Newcastle coal futures were near around \$120/MT, close to the 2-1/2-year low of \$117 hit on November 1st, mainly due to an oversupply in the Chinese coal market, resulting from increased domestic production and a substantial surge in coal imports



Source: <https://www.tradingeconomics.com>





Price



Source: <https://www.lme.com>



LME-HRC Steel-FOB China (USD/MT)



Price



Source: <https://www.lme.com>



Nickel futures fell below \$18,000/MT, the lowest since June 2021, amid a poor demand outlook triggered by fears of elevated interest rates. Simultaneously, the electric vehicle sector experienced a downturn, with manufacturers of batteries for new EVs gradually curtailing their input buying activity since the onset of Q3 2023



Source: <https://www.lme.com>

LME-Aluminium Price (USD/MT)



Aluminum has since rebounding from the two-month low of \$2,176 as supply concerns prevailed against the outlook of muted demand. Top producer China halted the expansion of production capacity beyond the current limit of 45 million tons as Beijing attempts to prevent the metal's oversupply and higher energy consumption from old, inefficient infrastructure

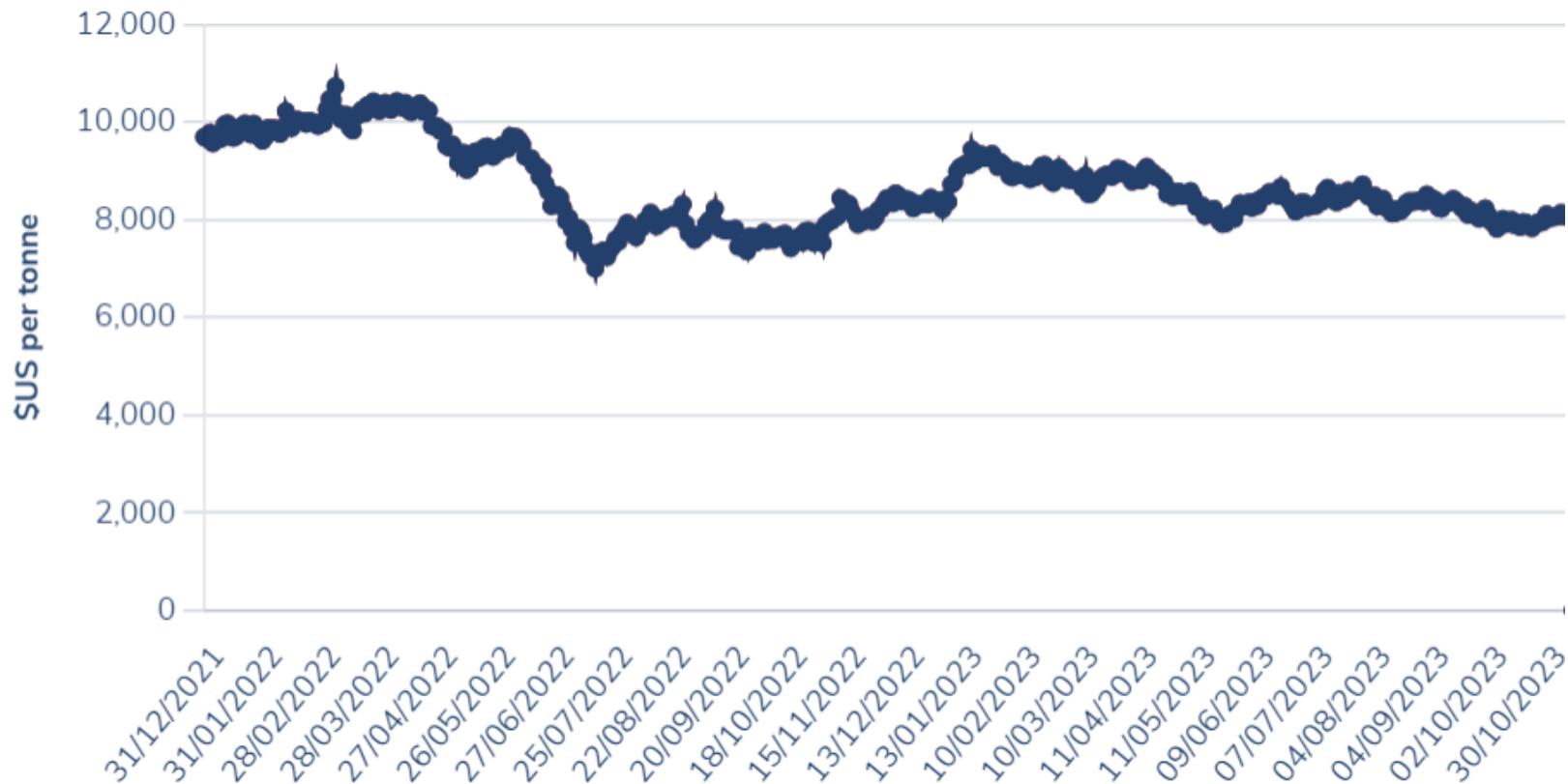


Source: <https://www.lme.com>

LME- Copper Price (USD/MT)

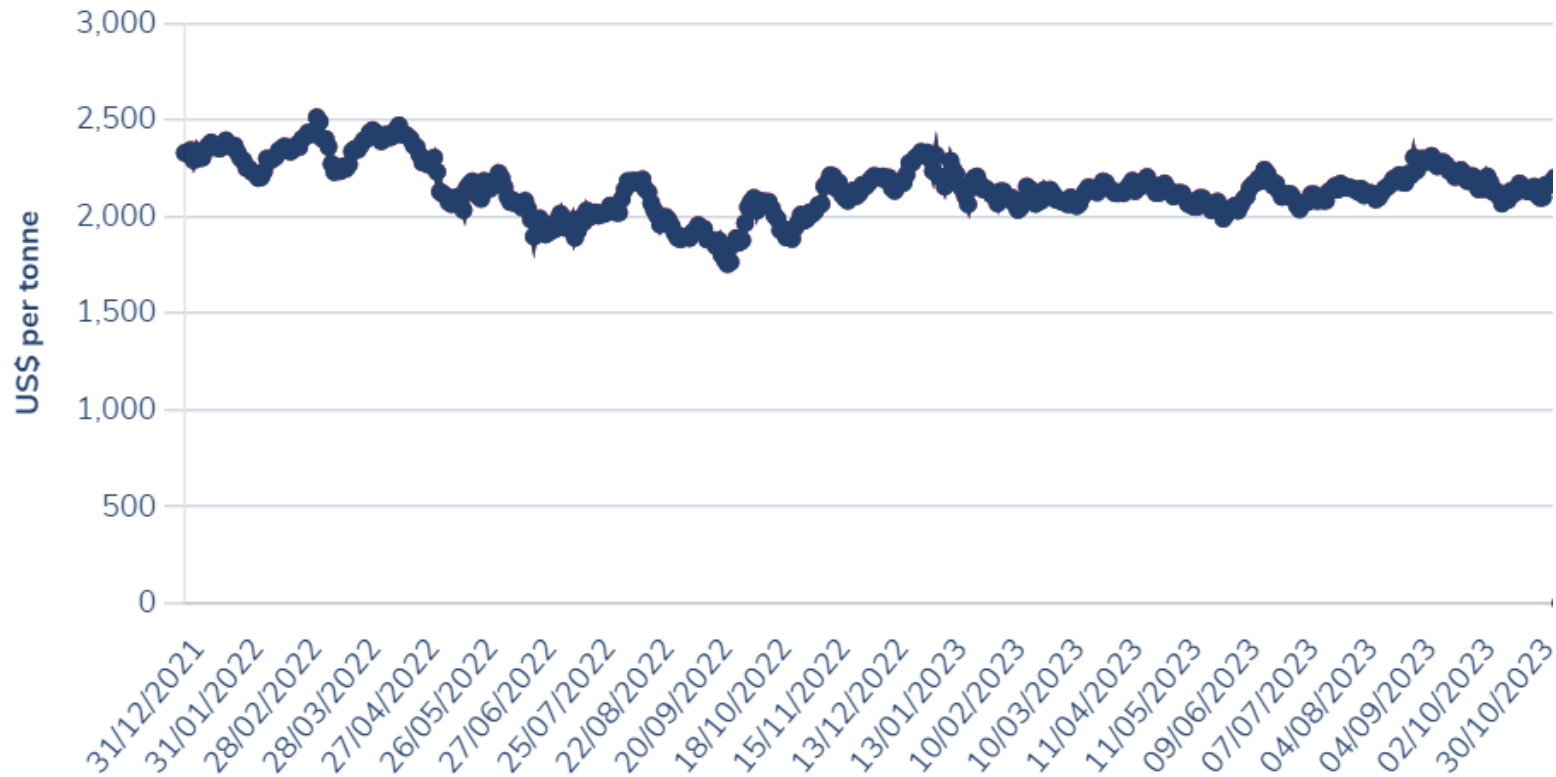


Copper futures fell to \$3.6 per pound, retreating sharply from the one-month high of \$3.7, pressured by a rebound for the dollar, respite in inventories, and demand uncertainties for top consumers



Source: <https://www.lme.com>

Lead decreased 138.70 USD/MT or 5.94% since the beginning of 2023,



Source: <https://www.lme.com>



Zinc prices rose above \$2,600/MT in November, underpinned by expectations of decreased output. Nyrstar, one of the leading zinc producers, announced the temporary closure of two of its mines in the U.S. at the end of October due to the impact of inflation. The shutdown followed halts of operations in Ireland and Portugal, further reducing an anticipated zinc production in 2024.

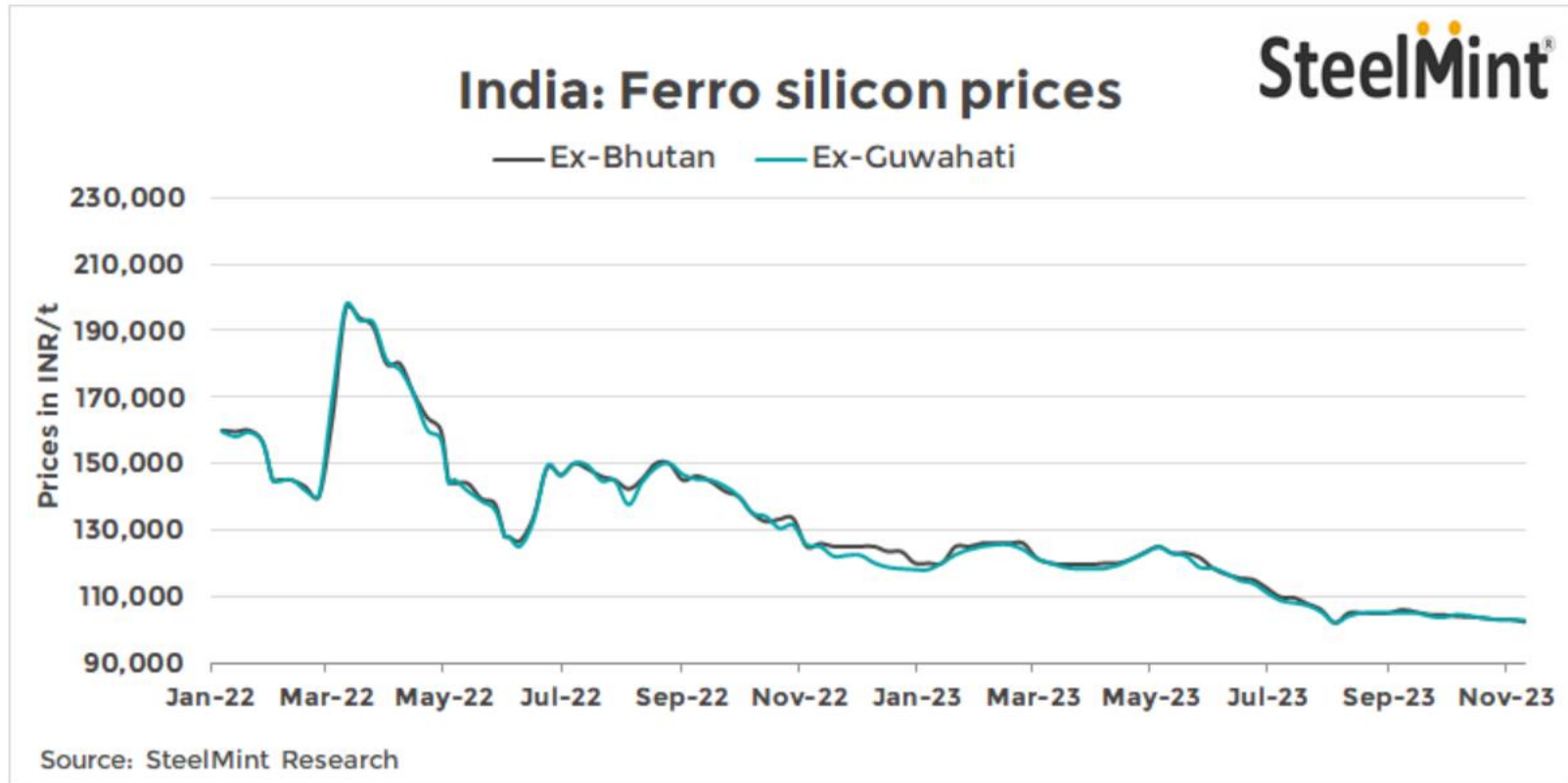


Source: <https://www.lme.com>





Indian ferro silicon (70%) prices remained stable w-o-w with a marginal drop of INR 250/ MT week-on-week. As regular trading activities continued in the market, prices stayed stable, supported by sustained demand



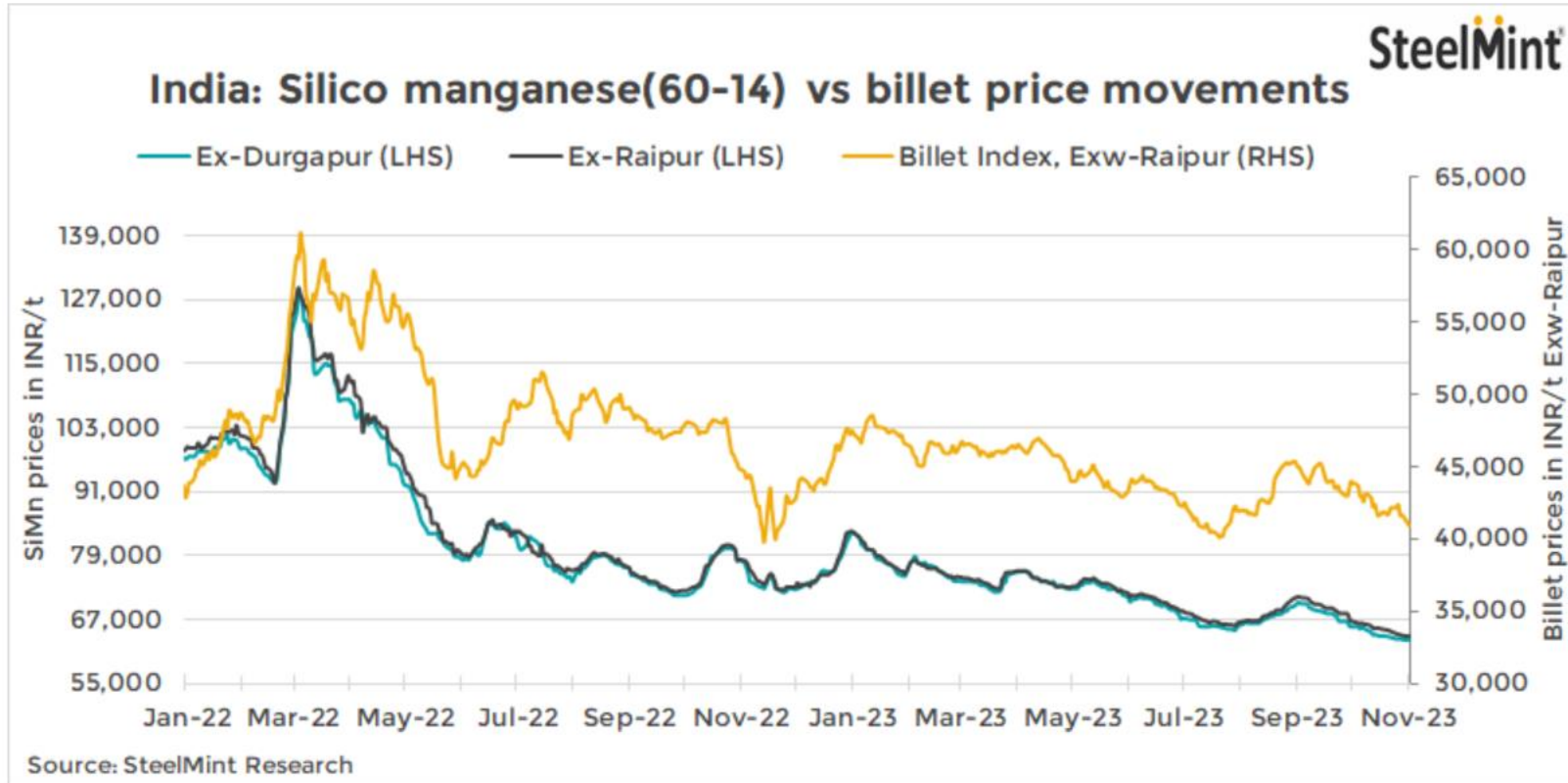
USD to the INR rate: 1 USD = INR 83.30

Source: <https://www.steelmint.com>

Ferro Alloys: Ferro Silico Manganese Price Trend



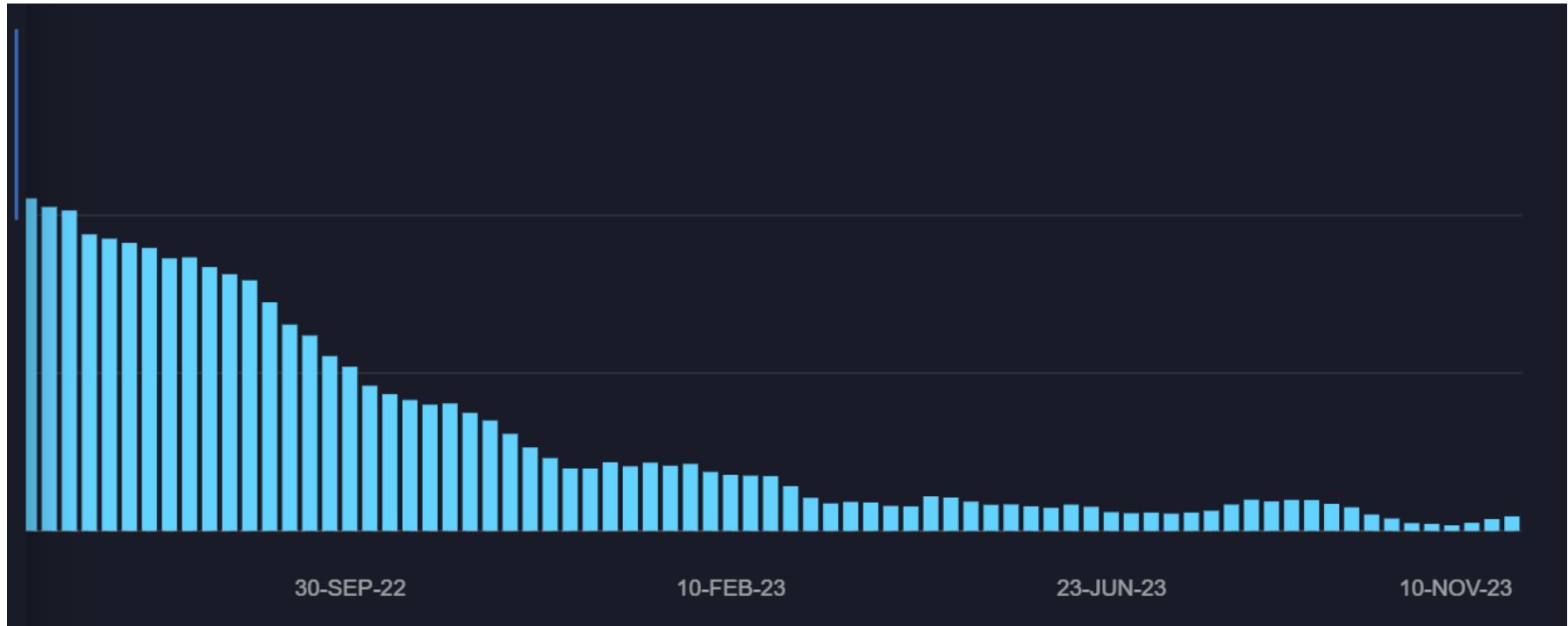
Prices for Indian silico manganese remained consistent with a slight decrease of INR 500/t w-o-w due to a decrease in inquiries from both the domestic and export markets, as well as competitive offers in the market.



USD to the INR rate: 1 USD = INR 83.30

Source: <https://www.steelmint.com>

Freightos Baltic Index (FBX) Global Container Index Freight movement for the last one year



Source: <https://fbx.freightos.com/>

Global Crude Steel

Worldsteel Demand Forecast October 2023



Steel demand to grow by 1.8% in 2023 and in 2024, demand will see a further increase of 1.9%

Regions	million tonnes			y-o-y growth rates, %		
	2022	2023 (f)	2024 (f)	2022	2023 (f)	2024 (f)
European Union (27) & United Kingdom	152.0	144.3	152.7	-7.8	-5.1	5.8
Other Europe	39.2	45.0	47.3	-2.5	14.9	5.1
Russia & other CIS + Ukraine	51.6	54.6	55.2	-12.0	5.8	1.0
USMCA	132.9	134.1	136.1	-3.0	0.9	1.5
Central and South America	44.9	44.2	45.1	-11.5	-1.6	2.2
Africa	39.5	37.9	39.9	0.8	-4.1	5.4
Middle East	57.1	56.1	57.9	7.7	-1.7	3.2
Asia and Oceania	1 265.3	1 298.3	1 314.9	-2.7	2.6	1.3
World	1 782.5	1 814.5	1 849.1	-3.3	1.8	1.9
World excl. China	861.6	875.2	909.8	-3.2	1.6	4.0
Developed Economies	374.7	368.2	378.4	-6.4	-1.8	2.8
China	920.9	939.3	939.3	-3.5	2.0	0.0
Em. and Dev. Economies excl. China	486.8	507.0	531.4	-0.6	4.1	4.8
ASEAN (5)	72.6	75.3	79.2	-0.2	3.8	5.2
MENA	76.6	74.0	76.6	9.4	-3.5	3.5

f - forecast

ASEAN (5): Indonesia, Malaysia, Philippines, Thailand, Vietnam

Source: <https://www.worldsteel.org/>



Countries	million tonnes			y-o-y growth rates, %		
	2022	2023 (f)	2024 (f)	2022	2023 (f)	2024 (f)
China	920.9	939.3	939.3	-3.5	2.0	0.0
India	116.2	126.1	135.8	9.3	8.6	7.7
United States	94.5	93.5	95.0	-2.6	-1.1	1.6
Japan	55.0	53.9	54.2	-4.2	-2.0	0.6
South Korea	51.3	53.0	53.6	-8.5	3.3	1.1
Russia	41.7	43.8	43.8	-5.0	5.0	0.0
Türkiye	32.5	38.7	40.6	-2.6	19.0	5.0
Germany	32.4	29.2	32.3	-8.8	-10.0	10.6
Italy	25.1	23.3	24.4	-5.6	-7.2	4.8
Mexico	25.0	26.6	27.2	-2.0	6.6	2.0

f - forecast

Source: <https://www.worldsteel.org/>



China

The 2024 outlook for China remains uncertain depending on the policy directions to tackle the current economic difficulties

India

Growth in India's construction sector is driven by government spending on infrastructure and recovery in private investment. Infrastructure investment will also support the capital goods sector growth. Healthy growth momentum will continue in automotive.

United States

Despite the resilience of the US economy to steep interest hikes, steel-using sectors are feeling the impact. Particularly affected is residential construction, which is expected to contract in 2023 and 2024

Source: <https://www.worldsteel.org/>



World crude steel production increased marginally by 0.1% YoY in the period Jan to Sept 2023

Regions	Sep-23 (MT)	% change Sept 23/22	Jan-Sept 2023 (MT)	% change Jan-Sept 23/22
Africa	1.3	↓ -4.1	11.9	↑ 6.6
Russia & other CIS + Ukraine	7.3	↑ 10.7	66.3	↑ 2.0
Asia and Oceania	110.7	↓ -2.1	1055.7	↑ 1.6
Middle East	3.6	↑ -8.2	32.6	↓ -0.6
North America	9.0	↓ -0.3	82.2	↓ -3.3
South America	3.4	↓ -3.7	30.9	↓ -6.2
EU (27)	10.6	↓ -1.1	96.2	↓ -9.1
Europe, Other	3.5	↑ 2.7	30.7	↓ -9.3
Total 63 countries	149.3	↓ -1.5	1406.4	↑ 0.1

Africa, Russia & CIS, and Asia regions have registered positive growth year over year for the period Jan-Sept 2023

Source: <https://www.worldsteel.org/>

Top 10 Crude Steel Producing countries

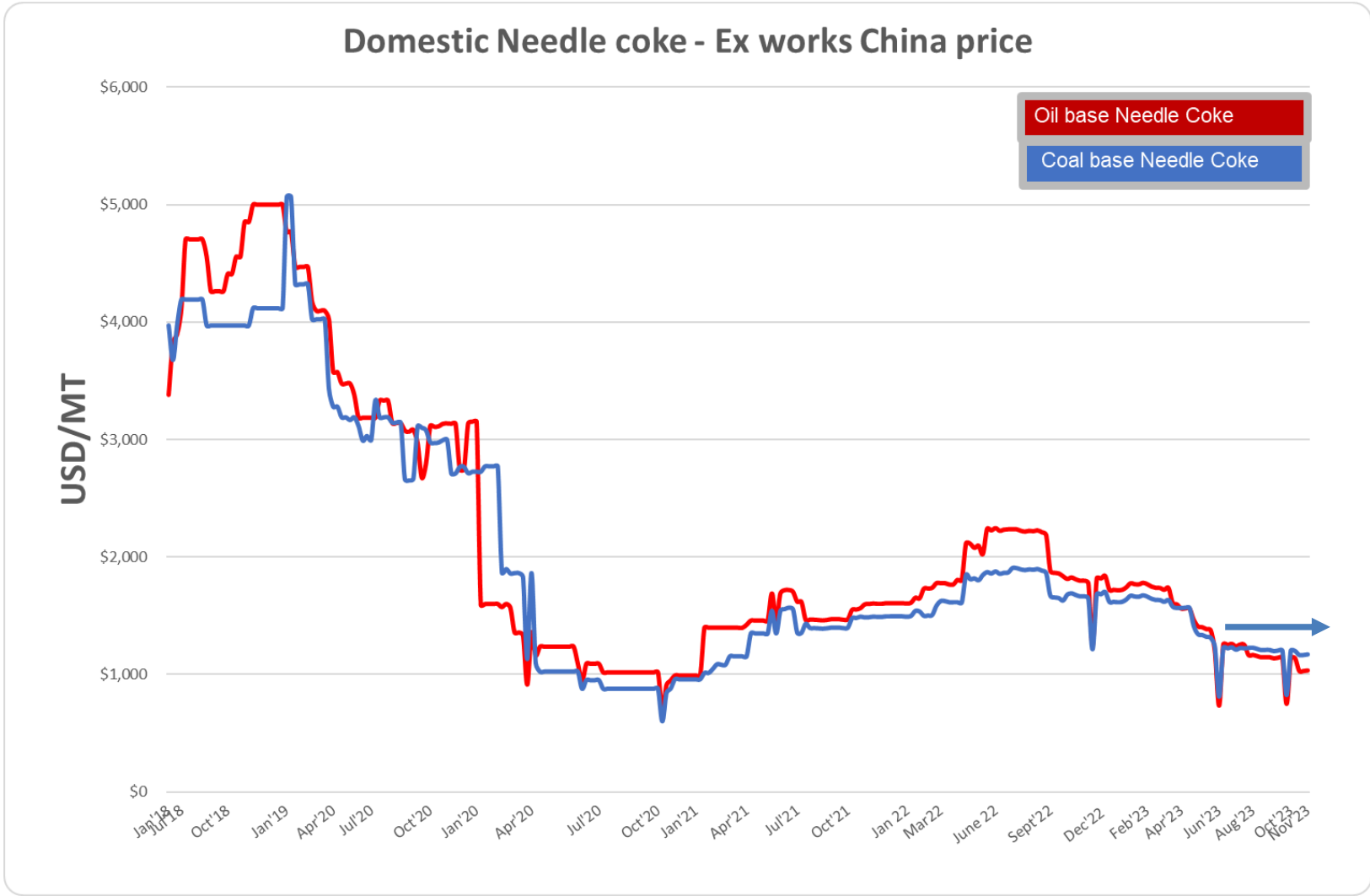


Countries	Sep-23 (MT)	% change Sept 23/22	Jan-Sept 2023 (MT)	% change Jan-Sept 23/22
China	82.1	↓ -5.6	795.1	↑ 1.7
India	11.6	↑ 18.2	104.1	↑ 11.6
Japan	7.0	↓ -1.7	65.4	↓ -3.6
United States	6.7	↑ 2.6	60.6	↓ -1.4
Russia	6.2	↑ 9.8	57.1	↑ 4.8
South Korea	5.5	↑ 18.2	50.4	↓ -0.4
Germany	2.9	↑ 2.1	27.2	↓ -3.6
Türkiye	2.9	↑ 8.4	24.5	↓ -10.1
Brazil	2.6	↓ -5.6	24.0	↓ -8.0
Iran	2.4	↓ -12.7	22.1	↓ -0.6

India continues to maintain impressive growth, China and Russia also show positive growth in steel production YoY

Source: <https://www.worldsteel.org/>

Graphite Electrode Outlook



Source: <http://www.iccsino.com>





- Needle coke and graphite electrode prices are moving close to stable now though the current demand side is still under pressure and expected to improve in 2024





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- Growth through AI in other economies around the world in the years that follow
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- Global Steel demand to grow by 1.8% in 2023 and in 2024, demand will see a further increase of 1.9%
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