Goldman Sachs | Commodities Research

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Commodity Views

The 5D Bull Market

- We remain selectively bullish commodities because 1) demand growth remains solid, 2) we see more structural upside in industrial metals and gold, and 3) oil's geopolitical risk premium has shrunk. We expect commodity total returns to rise from 13% YTD to 18% by year-end.
- 5D bull market trends will create structural opportunities in commodities:
  - **Disinvestment:** low investment in commodities induces select tightness
  - **Decarbonization & climate change:** require higher prices to attract green capex
  - **De-risking (hedging):** geopolitical de-risking and strategic restocking support demand for gold and critical commodities
  - **Datacenters & AI:** support demand via power and via higher incomes
  - **Defense spending:** support demand for metals and distillate fuels
- We expect copper to resume its sharp rally once finite stocks of cheaper substitutes deplete with an additional 15% of upside to $12,000/t by year-end.
- We expect gold prices to rise 14% to $2,700/toz by year-end on solid demand from EM central banks and Asian households.
- We forecast Brent to stay in our $75-90 range, but still see value in net long oil positions from geopolitical hedging and roll yield.
- We see limited further upside to natural gas prices this summer in the US and Europe given still elevated storage levels.

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The 5D Bull Market: Structural Opportunities in Commodities From Disinvestment, Decarbonization & Climate Change, De-risking (Hedging), Datacenters & AI, and Defense Spending

The 5D Bull Market					
Commodities	Disinvestment	Decarbonization & Climate Change	De-risking (Hedging)	Datacenters & AI	Defense Spending
Energy					
Crude Oil	◷		◷		
Refined Oil Products	☑ ◷		◷		☑ ◷
Natural Gas				◷	
Power		☑ ◷		◷	
Uranium	☑ ◷	☑ ◷	◷	◷	☑ ◷
Industrial Metals					
Copper	☑ ◷	☑ ◷	◷	◷	☑ ◷
Aluminum	☑ ◷	☑ ◷	◷	◷	☑ ◷
Battery Metals (Lithium, Cobalt, Nickel)		☑ ◷	◷	◷	☑ ◷
Precious Metals					
Gold			☑ ◷		
Silver		☑ ◷			☑ ◷
Agriculture & Softs		☑ ◷	☑ ◷		
Freight	☑	☑ ◷	☑ ◷		

☑ Already Supporting Commodity Returns ◷ Will Support Commodity Returns

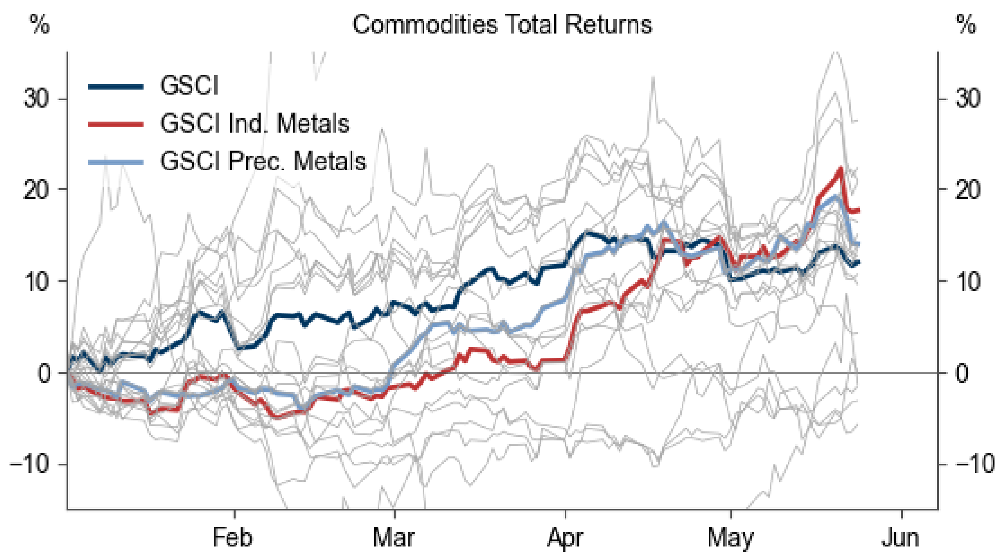
Source: Goldman Sachs Global Investment Research

The 5D Bull Market

Q1. Why do you remain bullish on commodities despite a significant rally year-to-date across many commodities (Exhibit 1) and despite a delay in expected Fed cuts?

We remain selectively bullish for the same three cyclical, structural, and geopolitical hedging reasons we highlighted in our 2024 outlook.

Exhibit 1: Significant Rallies Across Several Commodities YTD

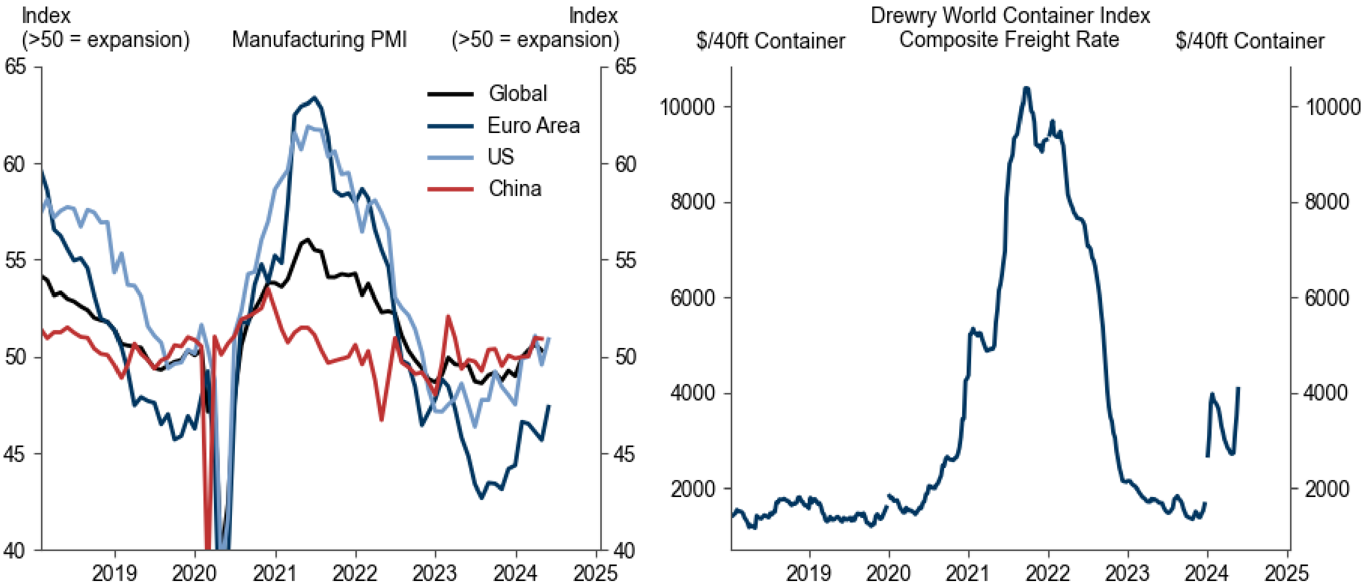


GSCI total return YTD = 13%; BCOM total return YTD = 11%. Data spans from 31 December 2023 to 29 May 2024.

Source: Goldman Sachs Global Investment Research

First, the cyclical outlook for commodity demand remains solid. While our economists and bond markets now expect delayed G10 easing cycles, the growth impulse from US financial conditions remains as supportive as at the start of the year. The outlook for manufacturing and China property—two still weak but key sectors for industrial commodities—has brightened somewhat with a gradual recovery in manufacturing PMIs (Exhibit 2) and China easing measures, including funds to begin purchasing excess inventory. The cyclical pickup in goods demand and in China exports also helps explain the jump in China LNG imports and the renewed rise in container shipping costs (Exhibit 2) along with the seasonal summer demand increase and ongoing diversions from the Red Sea.

Exhibit 2: The Recovery in Manufacturing Demand Is Lifting Manufacturing PMIs and Freight Container Rates



US PMI is average of ISM/S&P global surveys and China PMI is average of Caixin/NBS surveys. Euro Area and US include flash estimates for June.

Source: Goldman Sachs Global Investment Research, Haver Analytics, Drewry Shipping Consultants

Second, while structural tailwinds such as copper underinvestment and EM central bank gold buying have supported the metals rally, we see more room to run as, for instance, peak copper mine supply in 2025 will require scarcity prices. And after the selloff, refined oil product margins are no longer pricing the tightness we see as structural. Third, the reduction in the geopolitical risk premium in crude oil prices to just a few dollars makes it attractive to hedge against geopolitical shocks.

On net, we expect solid returns in select metals and oil to help take total commodity returns up from 13% YTD to 18% by year-end (Exhibit 3), and we continue to recommend our 2024 Deficits commodity basket trade (Long GSCI energy ex US natural gas, long GSCI industrial metals ex nickel, zinc), up 16% YTD.

Exhibit 3: We Forecast a 18% Total Return for the GSCI Commodity Index in 2024

S&P GSCI Commodity Index	Dollar Weight	Historical Performance			GS Forecast		
		2022	2023	YTD	Balance	2024	2025
S&P GSCI	**100**	**26**	**-4**	**13**	**4**	**18**	**10**
Energy	56	42	-5	14	8	23	12
Energy ex. Natural Gas	*53*	*42*	*-5*	*14*	*8*	*23*	*12*
Industrial Metals	12	-8	-4	19	6	26	27
Industrial Metals ex. Nickel & Zinc	*10*	*-9*	*-3*	*19*	*10*	*31*	*32*
Precious Metals	6	0	12	16	11	29	1
Agriculture	17	12	-8	6	-11	-6	-5
Livestock	7	5	0	11	0	11	-3
BCOM	**100**	**16**	**-8**	**11**	**1**	**11**	**7**

YTD runs through 29 May 2024. Total returns are displayed. These include the returns from spot price changes, the cash return from collateral, and the roll yield. Given we do not currently cover agriculture and livestock, we estimate spot returns as returns implied by forwards adjusted with the historical median risk premium. We estimate roll returns based on seasonal timespreads and the current futures curve shape.

Source: Goldman Sachs Global Investment Research

Q2. What is your structural call on commodities?

We believe that 5D bull market trends will likely create significant opportunities in commodities in coming years: **D**isinvestment, **D**ecarbonization & Climate Change, **D**e-risking (Hedging), **D**atacenters & AI, and **D**efense Spending (Exhibit 4).

Exhibit 4: The 5D Bull Market: Structural Opportunities in Commodities From Disinvestment, Decarbonization & Climate Change, De-risking (Hedging), Datacenters & AI, and Defense Spending

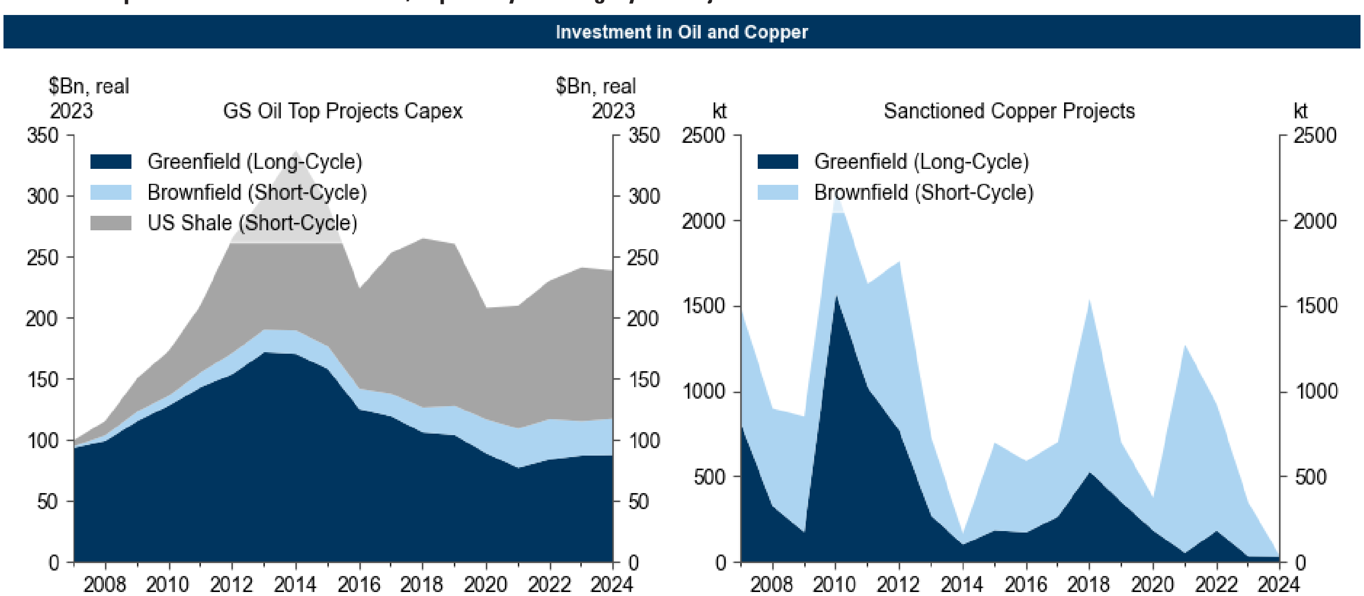
The 5D Bull Market					
Commodities	**Disinvestment**	**Decarbonization & Climate Change**	**De-risking (Hedging)**	**Datacenters & AI**	**Defense Spending**
Energy					
Crude Oil	◷		◷		
Refined Oil Products	☑ ◷		◷		☑ ◷
Natural Gas				◷	
Power		☑ ◷		◷	
Uranium	☑ ◷	☑ ◷	◷	◷	☑ ◷
Industrial Metals					
Copper	☑ ◷	☑ ◷	◷	◷	☑ ◷
Aluminum	☑ ◷	☑ ◷	◷	◷	☑ ◷
Battery Metals (Lithium, Cobalt, Nickel)		☑ ◷	◷	◷	☑ ◷
Precious Metals					
Gold			☑ ◷		
Silver		☑ ◷			☑ ◷
Agriculture & Softs		☑ ◷	☑ ◷		
Freight	☑	☑ ◷	☑ ◷		

☑ Already Supporting Commodity Returns ◷ Will Support Commodity Returns

Source: Goldman Sachs Global Investment Research

1. Disinvestment. Our team has long emphasized that investment in commodity production capacity has been low since the mid-2010s. Low investment reflects a decade of poor returns through 2020, and a higher cost of capital related to ESG pressures and uncertainty about long-run demand, which also has shifted capex from long-cycle to short-cycle projects (Exhibit 5). This shift has reduced oil reserve life by 55% over the past decade, but has also delayed the bullish impact from low investment in crude oil, where non-OPEC supply growth remains firm. In contrast, low investment is already leading to structural tightness in areas without significant short-cycle options, including in mining of green base metals such as copper and aluminum, refining of oil products, and oil tankers.

Exhibit 5: Capex Has Fallen to Low Levels, Especially For Long-Cycle Projects



Source: Goldman Sachs Global Investment Research

2. Decarbonization & climate change. While decarbonization and climate change have mixed effects on commodity demand, we think both will create significant investment opportunities.

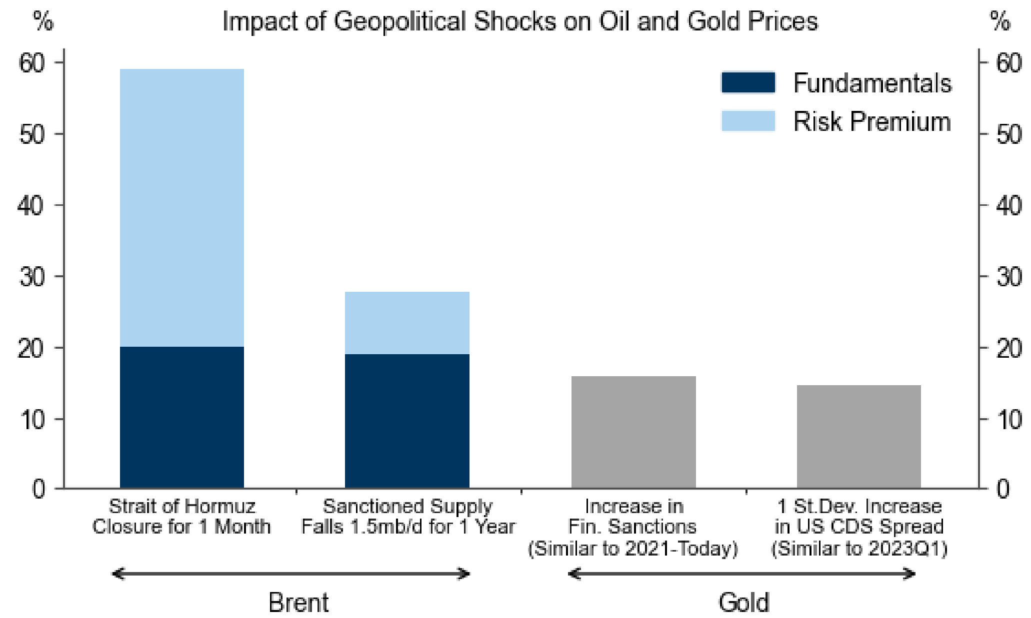
Decarbonization likely requires broadly higher commodity price indices to attract much higher investment during the transition, and to compensate for higher demand uncertainty. Our equity analysts estimate that achieving net zero carbon emissions by 2050 requires investing about 2% of global GDP in green infrastructure every year. The rise of NEVs (New Electric Vehicles) illustrates the net bullish effect of decarbonization on investment and commodity demand. While oil demand edges down with the NEV share in the global stock of cars (still only 2% in 2023), green metals demand rises rapidly with the EV share in global car sales (already 16%).

The impact of climate change is mixed for commodity demand with higher demand for cooling but lower demand for heating, but largely negative for agricultural commodity supply. Cocoa and coffee prices have moved sharply this year (+100% and +15% YTD, respectively) as heavy rainfalls followed by strong heatwaves in West Africa led to lower cocoa harvests, and extreme droughts in Southeast Asia resulted in lower coffee bean harvests. Orange juice prices are also hitting record highs (49% YTD) owing to the prospect of a poor harvest in Brazil, the world's largest exporter, driven by bad weather and disease. Finally, climate change is also boosting freight rates, as low water levels in the Panama Canal prompt shippers to divert to longer routes.

3. De-risking (Hedging). After a trade war, a pandemic, and ongoing wars in Ukraine and the Middle East, policymakers, companies, and investors are focused on managing and hedging geopolitical risks to supply chains and portfolios. These trends are structurally bullish for gold and long-cycle critical commodities.

We recently showed that EM central banks buy gold as a hedge against geopolitical and financial shocks, and that new geopolitical shocks may push gold prices significantly higher. We are also upgrading our estimates of the potential boost to oil prices from geopolitical shocks to supply in the Middle East by combining the fundamental impact via lower inventories (Exhibit 6, dark blue) and the likely rise in the risk premium (light blue).

Exhibit 6: Geopolitical Shocks Could Push Oil and Gold Prices Sharply Higher



We assume increases in the Brent risk premium—defined as the actual 1-36m timespread minus our estimate of its fair value based on OECD commercial stocks and interest rates—corresponding to percentile 99 in the distribution since 2005 for the closure of the Strait of Hormuz and to percentile 85 for a decline in sanctioned supply.

Source: Goldman Sachs Global Investment Research

Increases in strategic reserves of key commodities, including crude oil, distillate oil products, critical minerals (e.g. copper, palladium, cobalt), and soybeans/corn are bullish for apparent commodity demand. While the 2022 energy crisis may be long-run bearish for oil prices because of the positive supply response, the growing focus on security of commodity supply is likely bullish for long-cycle critical commodities (e.g. it takes 10-12 years to build a copper mine) because the strategic demand boost outweighs the supply response.

More broadly, the focus on supply chain security can boost demand for the new, green, and old economies, including duplicate 5G networks (the new economy), domestic EV production (green economy), and domestic manufacturing supply security such as steel production capacity (old economy). And while full de-globalization would be bearish for trade flows and thus transportation fuel demand, sanctions on Russian energy and Red Sea disruptions have actually boosted shipping demand via longer routes in a structurally bullish oil tanker market.

4. Datacenters & AI. Our economists estimate that widespread AI adoption could fuel a 10-year period where annual productivity growth is as much as 1.5pp higher than otherwise. Such an AI boom may raise commodity prices through 3 channels.

First, rapid growth in datacenters, which support cloud computing and AI algorithms, is already supporting demand for electrical power, which in turn can boost demand for natural gas, and critical metals such as copper and uranium. Our equity research analysts expect AI/datacenter demand to grow at an average annualized rate in 2023-2030 of 15% for US power, 14% for power outside the US, 14% for US natural gas, and 6% for the global copper market.[1] Relative to the commodity market size, the expected demand boost from AI/datacenters is significant and likely to grow over time for US power and US natural gas (demand depends on the number/level of datacenters), but relatively small and expected to peak around 2026 for copper (demand depends on datacenters growth).[2]

Exhibit 7: The Expected Demand Boost From Datacenters and AI is Significant for US Power and US Natural Gas

	Power		Natural Gas	Copper
	US	RoW	US	Global
AI/Datacenters Demand Level				
2023	17 GW	30 GW	2 bcf/d	183 kt
2030	45 GW	76 GW	5 bcf/d	283 kt
AI/Datacenters Demand Increase 2023-2030				
Annual Average Increase	4 GW	7 GW	0.4 bcf/d	14 kt
2023-2030 CAGR (%)	15	14	14	6
Commodity Total Demand Growth				
Contribution of AI/Datacenters to 2023-2030 Demand Growth (ppt)	0.9	0.2	1.2	0.04
2023-2030 Total Market Demand CAGR (%)	2.7	3.1	3.4	3.0

The CAGR for total market demand for power in the rest of the world is calculated from 2023 to 2026 due to data availability.

Source: Goldman Sachs Global Investment Research

Second, stronger aggregate demand and higher incomes could support broader commodity demand. Third, if productivity improvements are outside the commodity sector, then capital outflows may increase commodity supply constraints.

To be clear, AI may eventually also have negative effects on commodity prices if productivity enhancements boost commodity supply or lead to energy savings.

5. Defense spending. World military expenditure rose by 7% in real terms to $2.4tn or 2.3% of global GDP in 2023, driven by Russia's invasion of Ukraine and geopolitical tensions in Asia and the Middle East. US defense spending year-to-date has also risen faster than expectations (9% yoy vs. 2% expected). Elevated geopolitical uncertainty, commitments to increase spending from NATO countries, and defense spending as a share of global GDP suggest defense spending may increase further. Commodities intensively used by the defense sector include distillate fuels, copper, aluminum, steel, silver, uranium, and several other strategic minerals.

Q3. You are structurally bullish on copper, and expect the next leg of the rally from Q3. Why?

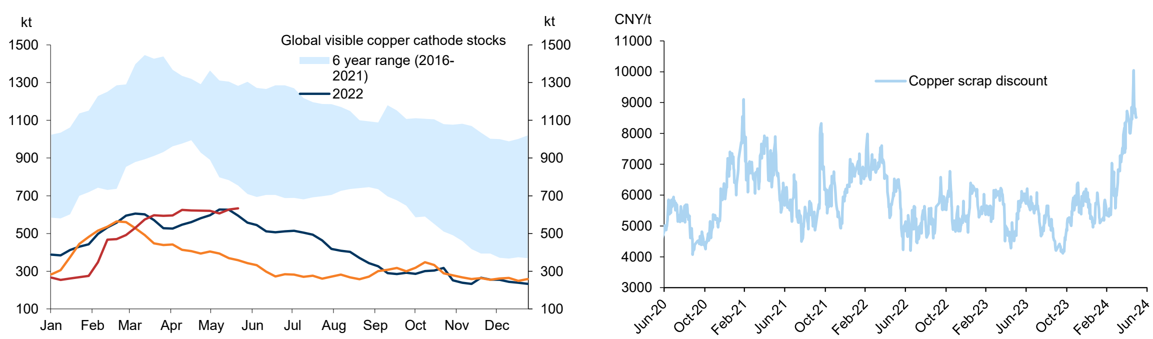
Our view remains that the copper cathode market is on the cusp of entering a period of deficit that is going to grow significantly into the second half of the year. The expected deficit inflection stems from a combination of 1) a progressive supply shock that has already led the copper concentrate market into extreme tightness, 2) a more supportive macro setting for Western demand, given the turn in the manufacturing cycle and expected monetary easing, and 3) a resilient China end-demand environment underpinned by green segments.

[1] Copper is used in three main applications within data centres: (1) power distribution (75%), (2) grounding and connections (22%), (3) plumbing and Heating, Ventilation, and Air Conditioning (HVAC) systems (3%)

[2] To be clear, the key swing factors in demand in coming years will be LNG export demand for the US natural gas market, and green capex for copper.

However, it is important to recognize that the metal market has yet to reflect that expected tightness, with global cathode stocks having remained fixed close to 600kt so far in Q2. The short term deferral of deficit does not reflect a broader failing in structural fundamental drivers, but rather the impact of a predominantly financially driven surge in cathode price over the past quarter. The outsized move in cathode price relative to fundamental bind has generated short term incentives to divert demand and tightening effects away from cathode to other segments of the copper market, most notable scrap and downstream products (semis). The evidence of this is particularly clear in China, where the onshore scrap discount has widened sharply and downstream semis product stocks are down 12% April-to-date. In the West, however, we would note that scrap discounts remain very tight, reflecting a limited short run midstream response from this region. Until the fundamental binds from weak mine supply and healthy end demand drive the tightness into the cathode market, we see a near term albeit brief phase of price consolidation as most likely. However, we expect by Q3 demand and tightening effects to have been diverted back toward cathode and a trend of stock draws from then onward. We expect copper price to move higher into the second half of the year and into 2025, reflected in our $12,000/t year-end target.

Exhibit 8: Midstream Responses in China Have Temporarily Reduced Copper Cathode Demand After the Sharp Rally in LME Price



Source: Goldman Sachs Global Investment Research, SMM, Wind, Bloomberg

Q4. You strongly recommend long gold positions. Why?

Because we expect gold prices to perform strongly in our base case, and because we see even more upside in geopolitical/financial tail scenarios where other assets would likely perform poorly.

Our base case is that gold appreciates to $2,700/toz by year-end (14%), owing to strong fear-related demand from Asian households and EM central banks and lower US interest rates.

Economic uncertainty and currency depreciation fears are driving Asian households, particularly in China due to the slumping property sector, to rush to gold. This surge in Chinese appetite for gold is more impactful than commonly appreciated. Although high interest rates in the West usually dampen gold's appeal — since it does not yield interest — this historically negative correlation has flipped this year. But gold hasn't just diverged from US yields; it is now more closely related to real yields in China, which is its new marginal buyer.

Fears of potential financial sanctions due to rising geopolitical risk and worries about US sovereign debt have spurred EM central banks to diversify their official reserves away from the US dollar and triple their purchases of gold. We think that strong demand from Asian households and EM central banks are structural trends, which will keep a firm bid under gold.

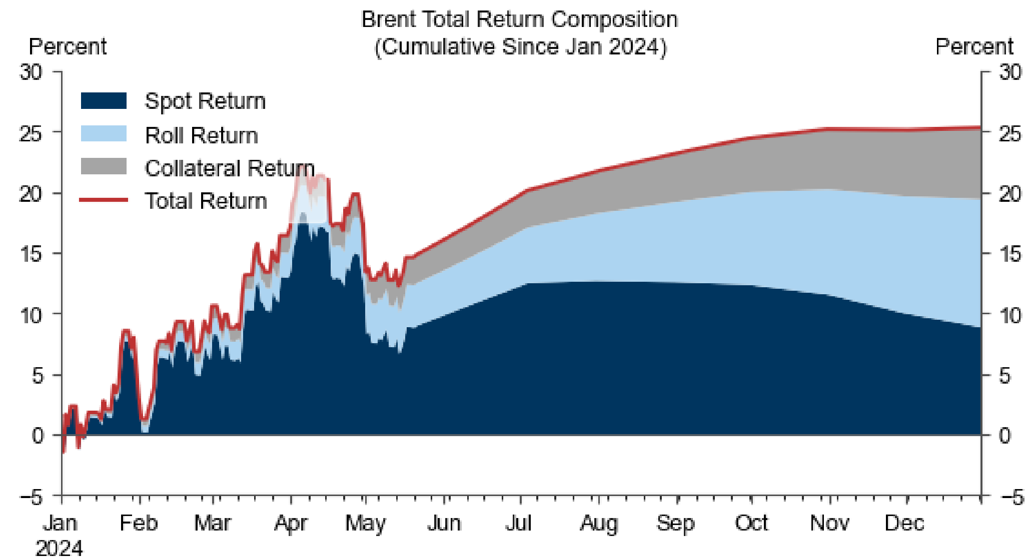
We see even more upside to the gold price in geopolitical and financial tail scenarios, in which equity-bond portfolios would likely suffer. Specifically, a rise in financial sanctions — similar to the increase seen since 2021 — may boost gold by an additional 16% (to $3,130/toz) on the back of additional central bank buying. Growing concerns over US fiscal sustainability, reflected in a one standard deviation increase in the US-5 year CDS spread, would raise gold prices by an additional 14% (to $3,080/toz). For context, such a hypothetical 13bp increase in the US CDS spread would be similar to the increase seen in 2023Q1 around the debt ceiling debate.

Q5. Why do you see value in long oil positions if you continue to call for Brent crude oil prices in a 75-90 range?

We think that elevated spare capacity limits the upside to oil prices, while OPEC's market management, low recession risk and opportunistic SPR purchases limit the downside. Given recent inventory builds, we expect OPEC+ countries to fully extend their voluntary production cuts in Q3 at Sunday's meeting.

While today's Brent spot price is equal to our 2024Q4 forecast of $85/bbl, we still see value in long oil positions for three reasons. First, we expect the oil market to remain in backwardation this year owing to solid demand and extended OPEC+ production cuts, which through the roll yield will continue to contribute to a significant total return on Brent futures of 25% this year (Exhibit 9). Second, the value of oil as a hedge against geopolitical supply disruptions has risen with the recent decline in the geopolitical risk premium. Third, we expect diesel refining margins to recover as diesel supply falls as a result of low margins for Asian marginal refiners and shifts in refining supply away from diesel.

Exhibit 9: Backwardation in the Oil Market Will Continue to Contribute to a Significant Total 25% Return on Brent in 2024 Via the Roll Yield



Source: Goldman Sachs Global Investment Research

Q6. How much upside do you see for natural gas prices following their rally in the US and Europe?

After pricing below \$2/mmBtu for nearly three months to incentivize production curtailments to prevent storage congestion, US gas prices rallied 30% in May to above \$2.80/mmBtu, before moderating back to a \$2.50-\$2.60 range. We believe this move was largely justified by a physical tightening in the market, primarily driven by a combination of sharp production declines (owing to both producer cuts and maintenance events) and a normalization in gas demand for exports following a significant outage at an LNG export facility during April.

However, we continue to see limited upside to US gas prices from current levels. Specifically - and as we recently discussed - we estimate that a sustained increase in prices relative to our \$2.65/mmBtu Sum24 forecast would lead to (1) a decrease in gas burns from coal-to-gas switching and (2) an unwind in production shut-ins, which we started to observe over the past week. This would ultimately prevent physical tightening in the market and keep storage on an elevated path, which could once again increase congestion risks. We expect Henry Hub prices to rise more meaningfully once we enter winter, with support from increasing feedgas demand from new LNG projects, and we maintain our \$3.80/mmBtu 2025 NYMEX natural gas price forecast, vs forwards at \$3.5/mmBtu.

In Europe, we see gas inventories comfortable throughout this summer, with low European demand keeping storage elevated, while a decline in European LNG imports, helped by strong Asia demand, contributes to preventing storage congestion this season. We expect this to keep European gas prices below coal, near 30 EUR/MWh (vs 35 EUR/MWh currently priced in the market). Going into winter, however, we note the region remains vulnerable to colder-than-average winters, given that global LNG supply doesn't start to grow more significantly until 2025 and beyond. As a result, we continue to see risks to TTF skewed to the upside this winter. In a colder-than-average winter scenario, European gas prices could quickly rally to gas-to-oil switching economics in a 63 EUR/MW (residual fuel oil) to 83 EUR/MWh (distillate fuel) range.

Disclosure Appendix

Reg AC

We, Daan Struyven, Samantha Dart, Nicholas Snowdon, Lina Thomas, Callum Bruce, CFA, Yulia Zhestkova Grigsby, Daniel Moreno, Hongcen Wei, Lavinia Forcellese and Blake Woods, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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