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Emerging markets: at the heart of the strategic materials supercycle

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"A material becomes critical when high economic or strategic importance meets significant risk to reliable supply."

We're in the midst of a materials-intensive investment cycle driven by several structural forces. While clean energy, electric vehicles (EVs), power grids, AI data centres, re-armament and more are lifting consumption, supply in several strategic markets cannot respond quickly enough. Emerging markets (EM) control much of the resource base and an even greater share of processing capacity, placing them at the centre of this cycle.

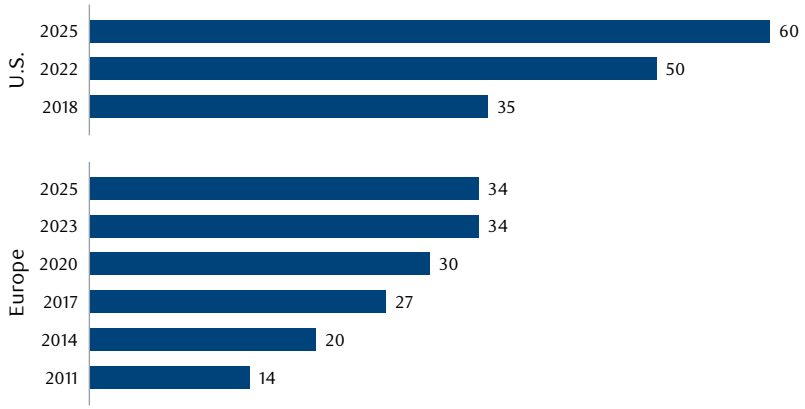
What makes a material critical?

The criticality of a material shifts as technologies change and supply chains relocate. A material becomes critical when high economic or strategic importance meets significant risk to reliable supply. That risk is often geopolitical and can arise even when material deposits are widely distributed, particularly when processing sits in a small handful of nations or alternatives perform poorly.

National critical lists have lengthened accordingly, with the U.S. expanding from 35 in 2018 to 60 in 2025. The EU has moved from 14 critical raw materials in 2011 to 34 and designates 17 of those as strategic, which reflects their relevance to clean energy, digital technologies, aerospace and defence (Exhibit 1).

Import dependency is where criticality bites hardest, particularly in economies with little domestic mining or processing. In 2025, the U.S. relied on imports for more than half its consumption of 33 critical minerals and was fully import-reliant on 13, while the EU sourced 95% of its rare earths from China[1].

Exhibit 1: List of critical minerals – U.S. and Europe



Source: U.S. Critical Minerals List (2025) and EU CRM Act (2025).

[1] European Court of Auditors (ECA).

Why this materials supercycle is different

Previous materials cycles rested on a narrower and more concentrated set of drivers than the current cycle. The 1970s commodity boom was driven by energy prices and inflation and faded once the oil shock passed, while the 2000s supercycle was driven primarily by China's industrialisation movement.

In our view, this cycle differs as several long-term investment cycles are converging, each lifting demand across a range of strategic materials and giving this wave greater durability. The IEA projects demand for key strategic materials to more than double from 13 million tonnes in 2025 to 27 million tonnes by 2040 (Exhibit 2). **Battery minerals** are among the fastest-growing materials as EVs and energy storage scale up, with exposure varying by battery chemistry. Moreover, renewable energy demand and electrification are growing well ahead of total demand and are set to make up a rising share of incremental consumption through 2030. Grid expansion and data centre construction also boost demand for **copper and aluminium**, while **rare earths** benefit from rising magnet use across multiple end-markets.

These demand drivers reinforce one another through the infrastructure each requires to expand. EVs need charging networks, which need more grid capacity, while data centres depend on power generation well beyond the equipment inside their buildings. The materials inside each end-product therefore represent only part of the materials demand it creates.

Precious materials add another leg of opportunity to this theme, with gold supported by central bank reserve diversification and rising fiscal concerns, while silver benefits from dual exposure through its growing industrial use.

Why supply cannot keep pace

Strong structural demand is meeting constrained supply, with projected shortfalls for the energy transition alone up to 150% of forecasted supply (Exhibit 3). Graphite faces the largest gaps, while lithium and copper also require substantial additional supply.

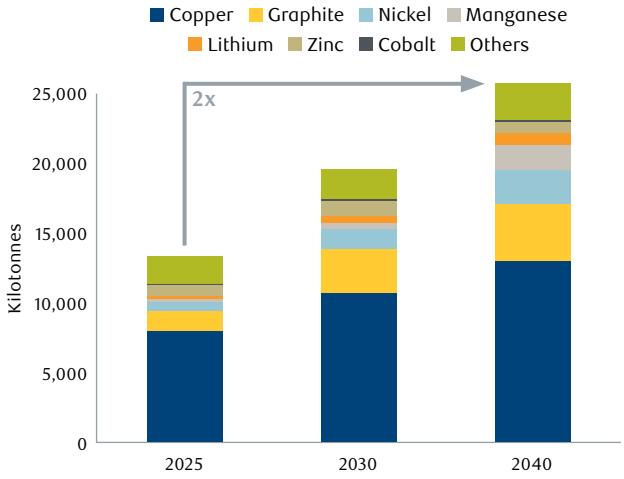
A key reason is the time required to bring a new mine into production. Average lead times rose from around six years in the 1990s to 18 years for those in production during 2020-2024, while projects still in development today can take up to 25 years.

> "EVs need charging networks, which need more grid capacity, while data centres depend on power generation well beyond the equipment inside their buildings."

Concentrated production gives governments considerable influence over how much material reaches global markets. Indonesia supplies more than half of mined nickel and has used export restrictions to build domestic processing, while in the Democratic Republic of Congo (DRC), which supplies circa 66% of mined output[2], cobalt availability is similarly sensitive to policy. China also dominates global refining, giving it considerable leverage in the materials space.

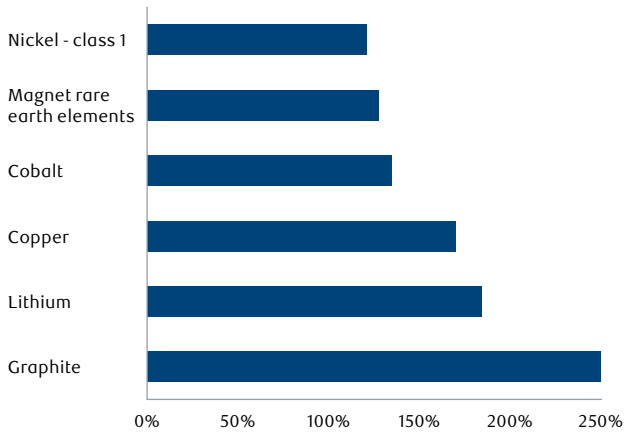
Heightened geopolitical tension has also raised the frequency of supply disruptions, even where mines and refineries keep operating normally. Conflict in the Middle East has threatened sulphur supplies used in copper and nickel processing, while China's 2025 rare earth export controls temporarily halted magnet shipments. In addition, while recycling offers partial supply relief, it doesn't fully close the gap.

Exhibit 2: Critical mineral demand set to double by 2040



Source: International Energy Agency (IEA), as at 2026.

Exhibit 3: Projected shortfalls needed for the energy transition alone range from 20-150% of existing supply



Source: IEA, BCG, as at 2026.

[2] IEA, 2026.

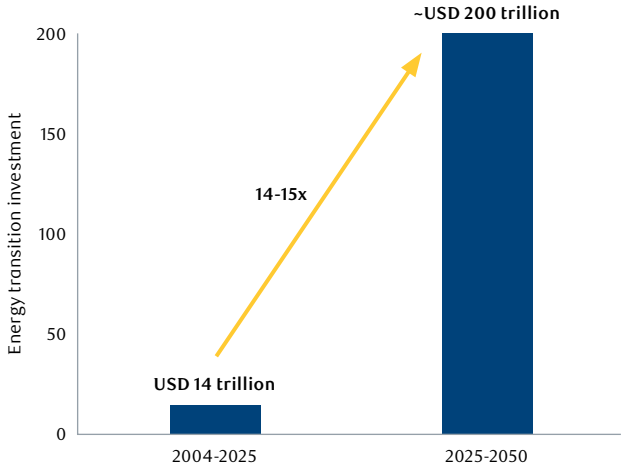
Key structural demand drivers

The clean energy transition: a decade ago, fossil fuel investment ran around 30% above spending on electricity generation, grids and storage[3]. Today, clean energy investment is around double the level of fossil fuel investment, and the IEA expects renewables and nuclear to supply 50% of global electricity by 2030. The requirement over the coming decades is far larger, with up to USD200 trillion of investment required between 2025-2050, which is 14-15x the capital deployed over the preceding two decades (Exhibit 4). Most of that spending supports electrified transport and buildings alongside the generation and networks needed to supply them.

EVs: these provide one of the clearest sources of structural materials demand since electrification materially increases the material content of each vehicle. A typical EV requires 6x the mineral inputs of an equivalent conventional internal combustion engine (ICE) vehicle (Exhibit 5).

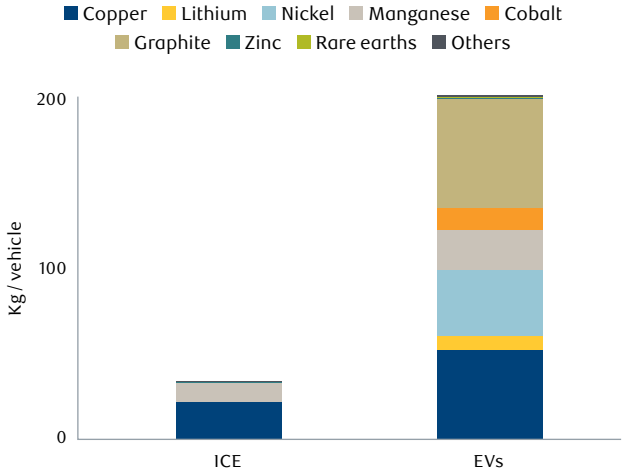
Consumption is set to grow substantially as battery EVs become the main source of global vehicle-sales growth through 2040, with hybrids retaining an important role where affordability or charging access slows full electrification. Charging networks and grid reinforcement then add further copper and aluminium demand beyond the vehicle itself.

Exhibit 4: USD200 trillion of clean energy investment required in the next 25 years



Source: BloombergNEF, as at 2026.

Exhibit 5: A typical EV requires 6x the mineral inputs of a conventional ICE vehicle



Source: IEA, as at 2026.

Electricity grids: electricity networks must expand as renewable generation creates new connections and absorbs rising load from EVs, while ageing infrastructure in developed markets needs replacement. Global grid length is projected to almost double by 2050, with Asia accounting for much of the new construction, while Europe and North America also require extensive reinforcement. Cumulative transmission and distribution investment is projected to reach USD7.5 trillion between 2025-2040[4], with distribution accounting for nearly three-quarters of that spending.

Defence: this is a relatively small end-market that carries strategic weight, as its materials are high-specification and difficult to substitute. Rare earths are crucial to modern defence platforms, with an F-35 fighter jet alone containing around 418kg of these minerals. Global military spending has now risen for the 11th consecutive year and is set to double to USD6 trillion by 2040[7], as NATO members target a 5% GDP benchmark and Asian budgets rise.

AI data centres and robotics: global data centre capacity is projected to more than double by 2035, with AI driving most of this incremental growth. This requires a substantial physical infrastructure build-out well beyond servers and semiconductors, to the electrical and cooling infrastructure that data centres depend on.

The same demand extends into robotics as AI moves from data centres into machines operating in the physical economy. The physical AI market, led by autonomous vehicles, drones, humanoids and industrial automation is projected to grow from USD148 billion in 2025 to USD955 billion by 2035[5], approaching a trillion-dollar opportunity within a decade. Each humanoid robot could contain up to 4-8kg of copper and 2kg of rare earth magnets[6]. With robot deployment potentially rising from around 5 million units today to 150 million by 2040, even a modest uptake of content per machine becomes a meaningful source of copper and magnet demand.

[3,4] IEA, 2026.
[5] Barclays Research, 2025.
[6] S&P Global, 2026.
[7] Stockholm International Peace Research Institute, 2026.

How to play the strategic materials theme

By market size, copper and aluminium are the largest, at USD348 billion and USD310 billion respectively, followed by nickel, lithium and cobalt (USD60, 29 and 14 billion respectively)[8]. The rare earth market is still niche at USD6 billion, despite its considerable strategic relevance.

In terms of investable opportunities, we believe copper and gold in particular offer compelling ways to play this theme:

1. Copper

Global copper demand is projected to rise from 28 million tonnes in 2025 to more than 40 million tonnes by 2040 (Exhibit 6). Construction and manufacturing remain the largest end-markets, while copper's conductivity gives it broad exposure across the newer themes, from renewable generation and grid connections to vehicle wiring and data centre components. Aluminium can substitute for copper only in selected applications, such as long-distance transmission lines where weight matters more than conductivity.

In our view, the central question for copper lies on the supply side, since the demand case is well spread. The copper industry is struggling to replace and expand its resource base, with major discoveries declining sharply since the 1990s. Existing mines are also becoming more difficult and costlier to operate as ore quality deteriorates, with average head grades (the amount of metal or mineral in raw ore dug straight out of the ground) across South American mines falling since the turn of the century. While recycling supply will ease some pressure, the gap remains significant at 25-30% by 2035 alone.

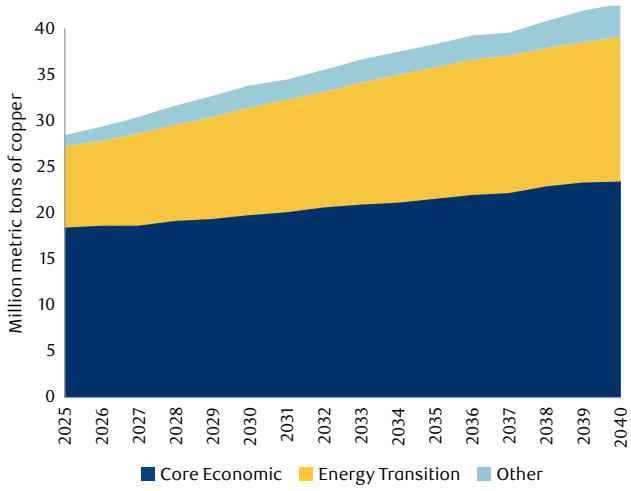
2. Gold

Gold has risen sharply to record levels since 2022 even as U.S. real yields remain elevated, breaking the inverse relationship that explained much of its previous price behaviour. Higher real rates would ordinarily weigh on gold by raising the opportunity cost of holding an asset with no income. Persistent official-sector buying has helped offset that pressure, indicating that monetary drivers alone no longer explain price movements.

Central banks have become a major source of demand, with EM central banks key to this increase. Buying has continued despite substantially higher prices, suggesting reserve decisions are less price-sensitive than private investment flows. Gold accounted for 27% of global official reserves at the end of 2025, overtaking the 22% held in U.S. Treasuries (Exhibit 7), and recent surveys suggest this shift could continue.

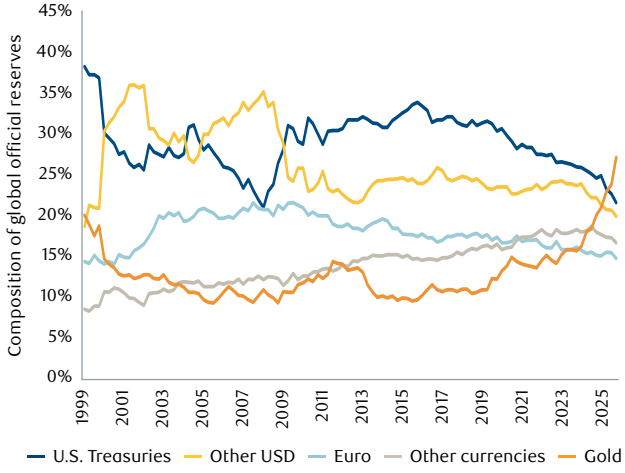
Furthermore, government debt and wider economic and geopolitical concerns add longer-term support for gold, with debt projected to remain high across developed economies through 2030. Rising fiscal concerns reinforce gold's monetary role whenever investors question the durability of conventional sovereign assets, giving this materials theme a defensive haven.

Exhibit 6: Global copper demand broadens across structural end-markets



Source: IEA, as at 2026.
Note: other includes defence, AI & data centres.

Exhibit 7: Gold overtakes U.S. Treasuries in global official reserves



Source: Financial Times UK, as at 2026.

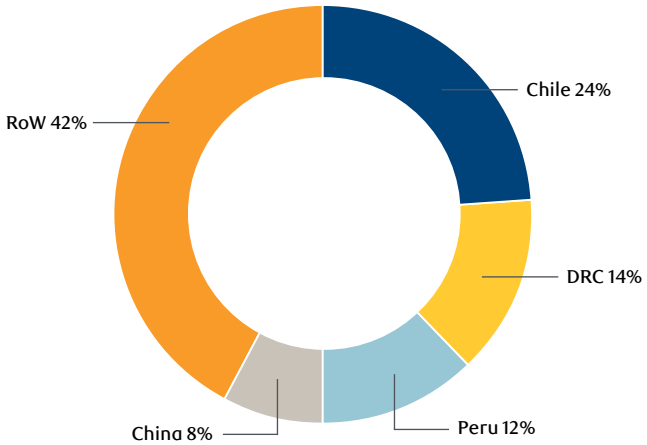
[8] IEA, September 2026.

Why EMs win

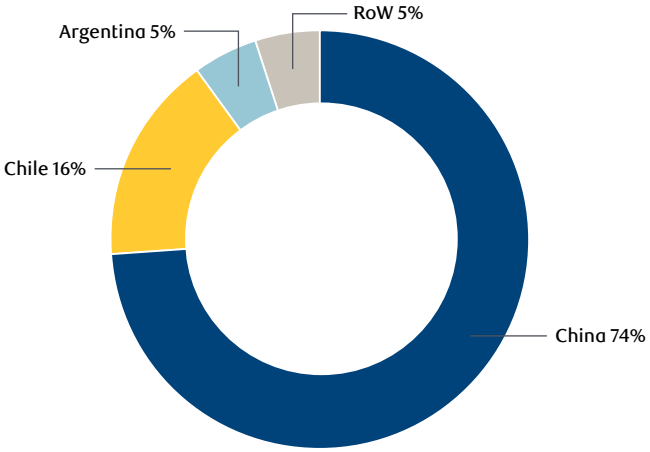
EMs sit at the centre of this cycle on both the demand and the supply side (Exhibit 8). Chile and Peru together supply much of the world's mined copper, Indonesia and DRC lead nickel and cobalt mining respectively, while China dominates the refining stage of strategic materials globally.

Exhibit 8: EMs dominate share in production and refining across this theme

Copper mining



Lithium refining



Source: IEA, as at September 2026.

Asia is equally important as a source of demand, accounting for just under half of global manufacturing output, with regional fixed investment projected to rise from USD11 trillion to USD16 trillion by 2030 as AI, energy and industrial capacity expands. We believe the scale of this industrial buildout bodes well for materials demand, as new manufacturing and energy capacity is highly metal-intensive.

China's lead across the materials chain is too entrenched to be replaced for the foreseeable future, given the capital and policy commitment required to match it. That lead is greatest at the refining and manufacturing stages, including around 85-90% of magnet rare earths, and 94% of graphite. Those refineries also supply a domestic manufacturing base that produces approximately 80% of the world's batteries and solar PV, and 70% of its electric cars. China has also moved to secure raw materials that feed this system, deploying more than USD120 billion of outbound mining FDI during 2023-2025, largely in Indonesian nickel, African copper and cobalt, and Latin American lithium.

Latin America currently holds one of the world's deepest resource bases with around 30% of global copper reserves and 40% of mine production, while Argentina and Chile together hold 40% of global lithium reserves. Brazil adds approximately 25% of global graphite reserves and 15% of rare earths. The region is equally significant in precious metals, with Mexico and Peru the key silver producers. It also holds around 15% of global gold reserves and production, led by Mexico alongside Peru and Brazil.

This resource wealth gives EM producers a strong base from which to capture more value across the materials theme. However, we note that refining capacity outside China has not kept pace with mined supply. While efforts are underway to expand this capacity, we believe substantially more investment and policy support will be required for EMs to move further up the value chain.

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