



Are commodities hot or not?

We ask what AI and green energy mean for investments in commodities...

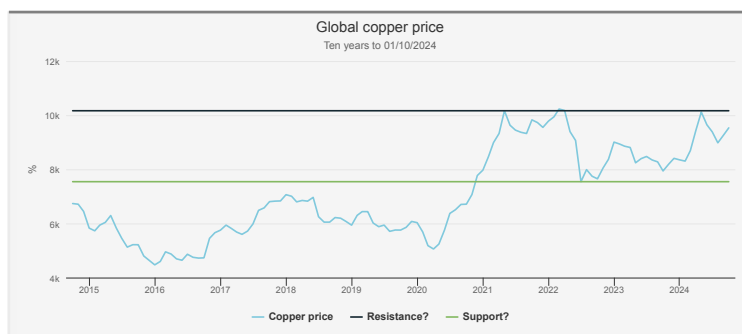
Update
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The commodity and energy sectors could almost be seen as polar opposites to the technology sector. Value sectors rather than growth, cyclical companies rather than those with higher quality earning streams, and old economy rather than new economy. But, to put it simply, we wouldn't have the internet, artificial intelligence, or mobile phones without oceans of raw materials to build the machines and power them. The key strategic areas in the economy right now all require vast amounts of materials, not only AI but also renewable energy. Both these require huge investments in power generation and transmission capacity. This means the fate of these sectors could be intimately entwined. Here we consider some of the key questions investors have to be asking about the commodity markets in light of these critical trends and ask which parts of the commodity complex will remain integral parts of the new economy.

1. Is copper now a secular, not cyclical commodity?

The decline seen in the price of copper since May may suggest its traditional role as a leading indicator for global growth is still important to the price, given the poor economic outlook during this period. In particular, the Chinese economy has been weak, and China has been the most important source of industrial demand for the metal for many years. It is true that the recent stimulus package in China led to a spike in the price, but since then the market has absorbed the fact that the stimulus has not been focussed on construction or real estate directly, and haven't

Fig.1: Copper Price 10Yrs



Source: International Monetary Fund, Global price of Copper [PCOPPUSDM], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/PCOPPUSDM>, December 10, 2024.

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changed the picture much as far as Chinese demand for commodities is concerned. Growth looks likely to remain weak and the construction sector a drag—while China's construction sector PMI has been above 50 all this year, it has declined considerably as the year has gone on. We think it's interesting, though, how modest the price drop has been. Since 2021, copper has hit support at levels well above its pre-pandemic peak, no matter how poor the outlook for China.

It may be that we are seeing the impact of the growth in demand for energy transition uses on the copper price. According to the IEA, c. 24% of global copper demand is driven by clean energy technologies. This share is projected to grow significantly, reaching as high as 51% by 2050 under its net-zero scenario. Most of this increase is projected to come from the expanded use in electricity networks, EVs, renewable energy systems, and battery storage. Put another way, as much as 82% of the growth in demand for copper between 2022 and 2050 is projected to come from the energy transition. For example, by 2050,



demand for copper from electricity grids alone is projected to increase by 5.6m metric tonnes, while renewable energy and EV applications could add another 6m metric tonnes a year. This compares to global copper demand of c. 26m metric tonnes in 2023.

Projected Sources Of Demand For Copper

COPPER USE UNDER ANNOUNCED PLEDGES	2021	2023	2030	2040
Cleantech demand (kt)	5,380	6,311	12,001	16,343
Total demand (kt)	24,928	25,855	31,128	36,379

Source: IEA, Global Critical Minerals Outlook 2024

All economic forecasts have to be taken as provisional, but we think there is good reason to believe that copper will be more resilient than in the past and less sensitive to the economic cycle. In fact, we think copper may be the ‘safest’ way to play the energy transition from the materials point of view. Recent political debates point to a slower shift to EVs, which may mean that hybrids play a role. Hybrids still require large amounts of copper themselves but also an expansion of electrical supply and the power grid.

That said, given the current relative weights of demand for the energy transition and for more traditional purposes, weakness in global demand, namely Chinese, will continue to be a key swing factor for some time. Because of this lingering cyclical exposure, **BlackRock Energy and Resources Income’s (BERI)** managers are wary of the short-term outlook for the copper miners but think a buying opportunity will come along. They are waiting for a better moment to build up a position in the copper specialists and prefer to take exposure via the diversified miners, where they see better value.

2. Is underinvestment creating a supply crunch for key commodities?

Supply has to be considered along with demand, and the new supply of copper has been tight in recent years. There have been specific issues in some of the key jurisdictions. For example, in Chile, state-run giant Codelco is suffering from reduced output due to delays in mine upgrades and operational setbacks. Similarly, in Peru, although social unrest has subsided since 2023, disruptions to investment and opposition to mining projects persist.

Fundamentally, investment in new copper mines has been inadequate, with global project pipelines struggling to catch up. The lengthy timelines to develop mines, often exceeding ten years due to permitting, environmental challenges, and financing hurdles, exacerbate this issue.

This supply-side bottleneck is particularly impactful given the increasing demand for copper in renewable energy technologies, electric vehicles, and infrastructure upgrades. The Bloomberg New Energy Foundation (BloombergNEF) estimates that copper demand will hit 39m metric tonnes a year by 2040, but only projects supply to grow to 25m tonnes in its base case scenario.

One of the most pressing challenges for the mining industry as a whole is the increasing capital intensity of new projects. According to analyses from Morgan Stanley and RBC, the cost of developing new mines has escalated sharply over the past decade. This increase is driven by several factors, including the depletion of high-grade deposits, stricter environmental regulations, and the need for more advanced technologies to extract resources from challenging geologies.

For example, while there is plenty of copper in the ground, the average grade of copper ore has been declining globally, requiring mining companies to process larger volumes of material to produce the same amount of metal. This not only increases operational costs but also raises the environmental and logistical complexities of mining projects. Similarly, lithium extraction often depends on hard rock or brine operations, both of which require substantial upfront investments to ensure sustainability and efficiency.

There is scope for technical advancements to make headway here, though. **BlackRock World Mining (BRWM)** has a position in an unlisted company called Jetti Resources, which has developed a new technique for leaching copper from low-grade deposits and extracted materials that would otherwise be considered waste. Jetti is currently in advanced discussions with a global mining company to deploy the technology, and BRWM’s managers expect that if such a deployment goes ahead next year, an IPO should follow. They note the position is currently valued at a 150% premium to the price they paid for their shares.

Overall, while the need for critical minerals is growing, investment in mining has not kept pace. BlackRock’s analysis of capex trends highlights that major mining companies have significantly scaled back expansionary spending since the commodity supercycle ended in the mid-2010s. Many firms have prioritised shareholder returns—through dividends and share buybacks—over reinvesting profits into new projects.

S&P Global Market Intelligence data indicates that global exploration budgets for nonferrous metals declined by 11% in 2023 compared to the previous year. This reduction is particularly concerning for materials like lithium and nickel, which are expected to experience exponential demand growth due to their roles in EV batteries and



renewable energy systems. The limited pipeline of new projects suggests that supply may struggle to keep up with demand over the next decade.

For copper, S&P Global forecasts a potential supply gap of up to 9.9 million metric tonnes by 2035 if investment in new mines and recycling does not accelerate. Meanwhile, the World Bank projects that lithium supply needs to increase by nearly 500% by 2050 to meet climate targets. However, current investment trends suggest a lag in the development of new capacity. Lithium extraction projects face significant regulatory hurdles, community opposition, and environmental scrutiny, all of which contribute to delays and cost overruns.

Nickel is another critical mineral for EV batteries, particularly in high-energy-density chemistries. Despite robust demand growth, nickel supply faces bottlenecks due to the geographical concentration of production in countries like Indonesia and the Philippines. Additionally, the processing of nickel for battery applications is capital-intensive, and many existing facilities are optimised for producing stainless steel-grade nickel rather than battery-grade material. Supply and processing of Nickel and Lithium is highly dependent on China.

This can lead to investment opportunities though, with Indonesia investing heavily in domestic production and refining of nickel. Indonesia hopes to use it as leverage in trade negotiations with the USA and have its nickel eligible to avoid the extra taxes due on EV-related products from China. To us, the supply situation looks bullish for the commodity producers over the medium term. What seems certain is that the timeframes that miners and those building out supply of commodities are well in excess of the normal (notoriously short term) investment horizon of listed equity investors. This fact, as well as the need to navigate geopolitics and trade barriers, mean there is a strong argument for active management over a more passive approach.

3. Are the world's oil fields at risk of being stranded assets?

Many predictions were made during the pandemic which seem a little over-enthusiastic a few years on. BP's decision to transform itself from an international oil company to an integrated energy company in 2020 may in retrospect be one of them. Certainly, the company has scaled back its plans since, reducing spending on renewables and slowing the planned reduction in oil and gas output. The truth is that oil demand has proven remarkably resilient, even in the face of global decarbonisation efforts. Over 140 nations covering 90% of global GDP have made a commitment to decarbonisation

and Bloomberg NEF data shows that renewable energy investment exceeded \$1trn in 2022, eclipsing upstream oil and gas investment. Despite all this, in 2023, global oil consumption reached record highs of around 102m barrels per day, driven largely by Asian markets. Countries like China and India are fuelling this growth, propelled by rising middle-class consumption, industrialisation, and urbanisation. For example, India alone is projected to account for 25% of global energy demand growth through 2040, with oil playing a critical role in meeting this demand.

OPEC and the International Energy Agency (IEA) underline that developing nations will drive oil demand in the medium term. This growth should offset declining demand in advanced economies, where decarbonisation policies and EV adoption are taking hold. BP's own Energy Outlook 2023 notes that even under ambitious net-zero scenarios, significant oil consumption would persist through 2050 for hard-to-electrify applications and in nations with slower energy transitions.

As well as demand from the emerging world, oil's importance for specific sectors is likely to support its relevance for decades to come. Petrochemicals, which account for about 12% of global oil demand, are integral to the production of plastics, fertilisers, and other essential materials. In this respect, it's interesting to note that it is the production of lighter products, natural gas and light crude, that has been driving the growth in the USA's energy production in recent years, and it is these products that are used for petrochemicals. Incidentally, USA crude oil production has exceeded pre-pandemic levels this year and hit all-time highs in August, well before Trump was elected, while natural gas production has long since blown past its pre-pandemic levels.

The election of Donald Trump has changed the policy picture for fossil fuel production in the USA and globally. The USA is already the largest crude oil producer in the world, and when combining the USA's natural gas, it produces more petro-carbons than Saudi Arabia and Russia combined. Trump looks likely to liberalise the environment for oil and gas production and extraction, and this has led the managers of BERI to increase their position in this industry. However, there is no suggestion so far that he will put obstacles in the way of renewable energy, but rather it looks likelier his administration will reduce red tape across the board. In our opinion, Trump views energy strategically and as a tool in geopolitics, and in that light, anything that increases the USA's dominance of the energy markets and reduces its energy costs is to be encouraged. Given that many of the business models in the renewable space depend on high levels of leverage, it may be that the interest rate environment is more impactful on any recovery in that sector.



In our view, there is still plenty of life left in the fossil fuel producers, and their slide into irrelevance is likely to be protracted. If so, then it is an obvious place for value investors to be looking, and we note that the sector is a major overweight for **Temple Bar (TMPL)**, the leading trust in the AIC UK Equity Income sector this year. TMPL owns Shell, BP, and TotalEnergies—although none have been good performers this year.

4. Is natural gas a bridge fuel?

One of the main drivers of falling carbon emissions around the world has been shifting from coal or oil to natural gas. Natural gas produces approximately 50% fewer CO₂ emissions than coal when used for electricity generation and about 20% less CO₂ compared to oil. This shift has been especially impactful in countries like the USA, where increased natural gas usage in power generation contributed to overall emissions peaking in 2007. Natural gas also emits far fewer air pollutants like sulphur dioxide and particulate matter.

Natural gas could even be a bridge fuel when it comes to automobiles. In China, LNG-fuelled trucks are rapidly taking market share, responsible for 21% of heavy-duty trucks in the first five months of 2024, with sales more than twice those of a year earlier. Natural gas trucks are more environmentally friendly than diesel trucks, with lower emissions of sulphur and particulates, while they are substantially cheaper to run than diesel trucks.

The USA is the world's leading natural gas producer and has been able to supply by sea natural gas to Europe as it weans itself off Russian gas. Russia and Iran are the next largest producers, followed by Canada and Algeria. According to the EIA, North America's LNG export capacity should more than double between 2023 and 2027 thanks to Mexico and Canada opening their first terminals and the USA expanding its own. It's interesting to note that the USA's own use of natural gas for electricity generation has fallen in recent years, so increased production is serving the rest of the world, not least Europe. (ESG analysts would give the black mark to the USA in this scenario, but we might question whether this really makes sense.) Estimates produced by BlackRock and Thunder Said Energy are for this decline in gas-fired power to continue, while it will remain the largest single source of power in the US well into the 2030s. They forecast solar, wind, and nuclear to provide the additional supply needed for the sharp rise in expected demand caused by the internet, artificial intelligence, and blockchain.

Natural gas looks like having plenty of longevity in the global energy mix, with one trend to watch being the shift in demand away from the USA and perhaps in time away

from Europe. This could provide investment opportunities in the producers, although companies like Shell are typically diversified and far from pure plays. It should also lead to opportunities in pipelines, shipping, and ports, all of which are likely to be built to more stringent environmental measures in the developed world at least. In fact, it could be argued that natural gas's relatively low emissions mean it could figure in an investment portfolio focussed on the energy transition. We note that **SDCL Energy Efficiency Income (SEIT)** has around 12% invested in Combined Heat and Power (CHP) systems which are powered by natural gas. These use the excess heat used in electricity generation to provide heating, with exceptionally high energy efficiency. SEIT has a further 13% in CHP systems that use waste gas or renewable sources, but these aren't always practical or available.

5. Is nuclear the secret sauce?

Ed Miliband's speech last week at the Nuclear Industry Association's Nuclear 2024 conference made clear the Minister for Energy Security and net-zero views nuclear as an essential part of the mix during the energy transition. He claims (we will leave it for others to go back and check) that he favoured nuclear when he was energy minister back in 2009. One could view this positively, or alternatively, find it a little sad that we aren't any further on than we were back then. In 2010, nuclear provided 16% of the UK's electricity, while in 2023 it was 13.5%. In fact, the reactor installed at Hinkley Point C last week is the first to be installed in 30 years.

However, Miliband, like many decision-makers around the world, is turning to nuclear to meet the increasing power needs of AI while lowering emissions. Hinkley Point C is forecast to be able to meet 7% of the UK's electricity demands when operational—although we are told not to expect that until the end of the decade. France, meanwhile, has reaffirmed its commitment by planning to build at least six new reactors. Poland, traditionally dependent on coal, has signed agreements with the USA and South Korea to build nuclear power plants, with the first expected to come online in the 2030s. Meanwhile, China leads the way with the most aggressive nuclear expansion globally. As of 2023, China has over 50 reactors in operation and plans to triple its nuclear capacity by 2035 to reduce reliance on coal and meet clean energy goals. India too has an ambitious programme, while even Japan is reopening reactors following the Fukushima disaster of 2011, targeting 20% of electricity production to come from nuclear by 2030.

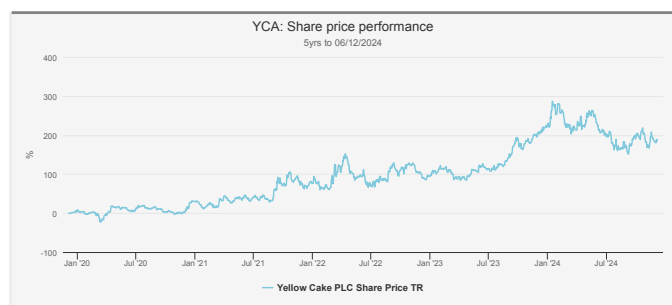
Fukushima led to a dramatic drop in the price of uranium which fell from around \$140 per lb to c. \$17 per lb in 2016. Prices started to recover in 2020, but really took off in 2023, spiking to c. \$105 before retracing to around \$78. Shareholders of **Ruffer Investment Company (RICA)** were



among those who benefited, as the managers bought in at depressed levels and sold near the highs via London-listed Yellow Cake. RICA's managers, Duncan McInnes and Jasmine Yeo, look for positions with asymmetric payoffs, meaning the potential upside is high but the downside limited, and as the price has risen they think the picture has changed for uranium. They do though, retain positions in the oil and gas majors discussed above.

Uranium is a very small market compared to the other commodities we have discussed, illiquid and traded over the counter. An important dynamic is that uranium costs are a very minor part of the costs of running a nuclear power plant. This means that the commercial buyers are price-insensitive, but also means the incentive to anticipate price rises is limited. In other words, while it may be that demand for uranium is going to rise rapidly, market participants are not necessarily worried enough to try to get ahead of it but might simply wait to see what turns up—namely new supply.

Fig.2: Performance Of Yellow Cake PLC



Source: Morningstar

Past performance is not a reliable indicator of future results.

The miners have done well this year though, even if the commodity price has fallen back. Cameco, the world's largest producer after Kazatomprom, is up around 45% at the time of writing and Denison Mines 36%. Even more remarkable returns have come from NuScale Power Corp, up 680% year-to-date. NuScale manufactures small modular reactors (SMR). It has struggled for years to get designs approved and funding secured, but the catalyst for the share price move seems to have been announcements by Amazon and Google that they would be investing in nuclear technology and SMRs specifically in order to meet their own needs to power AI applications.

SMRs offer a potential solution to one of the largest drawbacks of nuclear: cost. It is prohibitively expensive to build a nuclear power station, and this affects the price required to make it economically attractive. Hinkley Point C, for example, has a guaranteed price of £92 per mwh plus CPI. This is in the ballpark of the current UK spot price for electricity, in the midst of winter, but well above what was a normal price before the Russian invasion of Ukraine, even in winter.

The drawbacks of nuclear include the long timeline to get projects up and running, the high cost of the electricity generated and the safety issues. It does seem that public attitudes to the latter are changing, perhaps in light of high energy prices, but the other two issues don't seem likely to be resolved. We think nuclear's promise means it could, however, be worth a small position in a portfolio. The managers of both BERI and BRWM have small positions in uranium miners, seeing the high potential payoffs if policy decisively breaks in their favour. Meanwhile, the investment trust Geiger Counter (GCL) offers diversified exposure to the UK retail investor and sits on a 16% discount. It has, however, struggled in 2024.

Conclusion

Demand for the energy transition and artificial intelligence is revolutionising the picture for commodity markets. We don't see any real evidence of a retreat on the strategic drive to net zero, but rather that we are being swamped with demands for energy that are making it slower going. Meanwhile, geopolitical reality is biting, and the strategic importance of access to power and raw materials is being thrust into public consciousness. In this respect, we can only lament that British governments have seemed to overlook this dimension for many years, and together with our friends over the other side of La Manche, we are in a sticky situation. The USA looks to be a real winner though, with abundant sources of multiple key fuels and low power prices which encourage innovation and growth.

From an investors' point of view, we think the long-term outlook for the old economy sectors of commodities and energy looks attractive, particularly when considering the discounts of the shares of the main investment trusts which offer exposure to them. Chinese demand remains critical for the key industrial metals and will do for some time, but its importance is waning, and over the medium to long term, we think an investment in commodities could even potentially serve as a hedge against further geopolitical tensions.



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