

The Influence of Geopolitics on the Supply Chain of the Energy Transition

Growing geopolitical instability, including events such as the Russia-Ukraine war, has intensified the conversation in every jurisdiction around energy security. This, together with the increasing pace of climate change, has highlighted the urgent need to transition to renewable energy to reduce reliance on energy from unpredictable or politically unstable countries, whilst also transitioning to a more sustainable energy system. Whilst wind and sun are local resources, it is important to recognise that the production of key renewable technologies, such as solar panels, wind turbines, and batteries depends on the availability and price of critical minerals and metals, and is therefore still deeply vulnerable to global geopolitics. Key materials like copper, lithium, cobalt, nickel, and rare earth elements are concentrated in specific countries, and therefore political decisions, including trade policies, tariffs, conflicts and resource nationalism, will impact the cost and availability of these essential materials. This will have a direct influence on the pace and scalability of renewable energy infrastructure, and ultimately, the broader goal of transitioning to a more sustainable energy future. The impact of geopolitics on the energy transition has never been more relevant, with ongoing trade wars and shifting international relations complicating global markets.

This article provides an insight into how various recent geopolitical events and decisions are impacting some of the key metals and minerals required for the energy transition.

Copper

Copper plays a crucial role in the energy transition as its high electrical conductivity makes it indispensable in wind turbines, solar panels, EVs, and electric grids. As the world shifts toward greener technologies and increased electrification, the demand for copper is growing rapidly - electric vehicles (EVs), for example, use up to four times as much copper as traditional vehicles, while 1MW of solar and wind use 2-3 times and 5-8 times more copper, respectively, than producing 1 MW of energy from a coal or gas fired power station.

There have been a number of global political decisions recently which are influencing the copper market in various directions. Ongoing trade tensions between the U.S. and China have had a ripple effect on the copper market. The imposition of tariffs and export restrictions has created uncertainty in the global copper trade, affecting supply flows and pricing. In particular, China's dominance in copper consumption and processing has meant that any disruptions in trade relations can send shockwaves through the copper supply chain, impacting prices and availability. The relentless construction of additional copper smelting and refining capacity in China has meant that copper concentrate treatment charges are now well below cost in most smelters, putting the continued viability of copper smelting in regions without government subsidisation at risk. This has been exacerbated both by copper mining nations, such as Indonesia and the DRC, demanding more local processing of copper concentrates, and other growing jurisdictions such as India, Kazakhstan and the Middle East also adding further smelting and refining capacity to guarantee copper availability to support their own energy transitions. China remains the world's largest consumer of copper, and its continuously increasing focus on building out its green infrastructure has led to higher demand for the metal, which has to date driven up prices and increased geopolitical tensions over access to supply of copper concentrates.

Although Russia is not a major copper producer, the Russia-Ukraine war impacted the price of sulphuric acid which in turn has impacted the viability of copper oxide leaching operations elsewhere in the world.

Furthermore, rising energy costs due to the war have impacted copper mining operations globally, as energy-intensive smelting processes have become more expensive.

Activity within key copper producing countries have also impacted the supply and therefore price of copper. Chile, the world's largest copper producer, has introduced stricter environmental policies and higher labour costs, while protests and social unrest in Peru has led to suspensions and delays in copper production, threatening the stability of the country's copper supply chain and creating volatility in copper prices. Meanwhile mining labour strikes and increased operating costs in Australia have contributed to production slowdowns, which have also impacted the global supply of copper. The threat by the Trump Administration to place a 25% tariff on copper imports into the USA has also created a significant gap between copper prices traded on the London Metal Exchange (LME) and on the Commodity Exchange (Comex). This is creating distortions in the usual economics around supply and demand, with the mining and smelting industry in the USA uncertain as to whether long term investment decisions can be based upon potentially short-term tariff protection.

Lithium

The lithium supply chain, crucial for electric vehicle (EV) batteries and energy storage systems, has been significantly impacted by geopolitical decisions, particularly Trump's tariffs on Chinese goods. These tariffs, imposed during the trade war with China, have targeted lithium-related materials, raising costs for U.S. companies that rely on Chinese exports of lithium and its processing. As China controls much of the global lithium refining and processing industry, the tariffs have disrupted the supply chain, making lithium more expensive for U.S. manufacturers of EVs and energy storage systems. This has not only raised prices for lithium but also created uncertainty for companies relying on stable access to this critical material.

Beyond the impact of tariffs, other political decisions have further complicated the lithium market. In Mexico, the government took a significant step in 2022 by nationalising its lithium reserves. The move placed Mexico's vast lithium resources under state control, halting private investment and delaying new mining projects. Mexico holds some of the world's largest untapped lithium deposits, and this policy shift has raised concerns about the pace at which these resources can be developed. With foreign investment now restricted, the country faces challenges in rapidly scaling up its lithium production to meet global demand.

Similarly, Chile and Argentina, two of the world's largest lithium producers, have introduced policies that limit foreign ownership or increase state control over lithium mining operations. Chile, for example, has announced plans to create a state-owned lithium company to oversee its lithium resources. These actions are intended to ensure national control over lithium extraction but have created uncertainty for global investors, slowing the development of new lithium mining projects in these countries.

Cobalt

Cobalt is a critical material in lithium-ion batteries, especially for electric vehicles (EVs) and energy storage systems, due to its role in improving battery performance, energy density, and stability. The Democratic Republic of the Congo (DRC) is the world's largest producer of cobalt, supplying around 70% of the global demand, with China controlling as much as 80% of the global cobalt refining capacity. The DRC has raised concerns that China has been overproducing cobalt to drive prices down, prompting the DRC to impose a four-month ban on cobalt exports in February 2025, in an effort to increase prices and support local mining companies. This will likely increase the cost of cobalt and potentially driving up prices for industries reliant on this mineral, particularly battery manufacturers and tech companies.

While LFP (Lithium Iron Phosphate) batteries, which don't use cobalt, are gaining popularity in some applications, particularly in EVs and energy storage, they still offer lower energy density compared to cobalt-based chemistries. As cobalt remains essential for many current technologies, any supply chain disruptions will have wide-reaching impacts, affecting everything from transportation to digital infrastructure. The political instability and armed conflict within the DRC mean that security of supply from this jurisdiction is a significant concern. Furthermore, uncertain political relations between China and much of the western world are creating a reluctance to be dependent upon refined cobalt supply from China. Persistent low prices for cobalt are however acting to disincentivize the development of new cobalt mining and refining capacity outside these two countries.

Nickel

Nickel is crucial for the energy transition, particularly in electric vehicle (EV) batteries, energy storage, and hydrogen production. For years, the Philippines, one of the world's largest nickel producers, has increased low-cost production as technologies to process low grade nickel pig-iron has become more efficient and less costly, leading to an oversupply that drove prices down. This glut caused financial strain on mining companies, resulting in bankruptcies, divestments and a slowdown in new nickel mining projects.

However, the Philippines has recently begun restricting nickel exports to stabilise prices. This shift may lead to a supply crunch, as new projects are faced with long lead times and as global demand for nickel rises rapidly due to its importance in EV batteries (like NCM and NCA chemistries), hydrogen production, and infrastructure for renewable energy projects like wind turbines and solar panels.

With fewer new projects being developed and export restrictions in place, the nickel market could face tight supply in the near future, driving up prices and potentially slowing the pace of clean energy technologies. Mining companies will remain reluctant to take long term investment decisions in nickel projects whilst the threat of Philippine over-supply remains.

Conclusion

So whilst the energy transition is essential for decarbonisation and improving local energy security, it is important to be aware that there is still exposure to political risks, which need to be monitored and addressed to the extent possible. Global geopolitics, conflicts and trade wars are contributing towards creating compartmentalisation of supply and demand of key minerals and metals, reducing efficiencies in global supply chains and investment decisions, increasing competition for limited resources and potentially slowing down the pace of decarbonisation, whilst driving inflation up, GDP down, and impacting equity returns and living standards. It is crucial for countries to work together and make thoughtful policy decisions to ensure the energy transition progresses quickly and effectively across the globe. This includes creating transparent markets with clear standards and guidelines, international cooperation, environmental protection, favourable permitting and fiscal regimes (tax and royalties), and active involvement of local communities.