Managed by Zürcher Kantonalbank

swisscanto

Critical Minerals: The Basis for the Energy Transition.

The availability of critical minerals is likely to have a substantial influence on the pace of the global energy transition. This dynamic transformation promises significant growth and makes the investment theme interesting from a sustainable investment perspective, as the analysis shows.

Customer version | Swiss edition

Prepared by: Dominik Ladner, Dr Gerhard Wagner and Rocchino Contangelo, Asset Management by Zürcher Kantonalbank

Regions analysed: Global

Sectors: Metals and mining

Sustainable Development: Affordable and Clean Energy | Industry, Innovation and Infrastructure | Climate Action

Publication date: March 2025

Foreword

The global market for critical minerals is growing rapidly, driven largely by the introduction of new technologies to generate clean and renewable energy. Examples include solar power, wind power and batteries for electric vehicles (EVs).

This development means that the underlying minerals are becoming more important – both in terms of decarbonising the economy and for those countries that do not have their own resources. It is not surprising that the International Energy Agency's (IEA) forecasts[1] suggest that demand for these minerals, which are crucial for the transition to a more sustainable economy, could rise sharply.

This is also important from the perspective of sustainable investing. Therefore, the challenge for investors, companies and governments is likely to be to reconcile supply with this growing demand. Furthermore, it will be important to diversify geographically and ensure the environmentally responsible mining of these minerals.

This can be seen in the example of copper (see Section 3), which is of paramount importance in the decarbonisation of the economy.

The topic of critical minerals at a glance
The shift towards renewable energy, electrification and a circular economy is directly linked to the demand for critical minerals. As this transition accelerates, the market for critical minerals also experiences significant growth. The following drivers are having an impact:

- The unprecedented expansion of markets for critical minerals is driven by the widespread adoption of clean energy technologies and electrification. These include solar power, onshore and offshore wind power and EV batteries.

- Secondary supply, including recycling, already plays an important role for some critical minerals. This secondary supply is likely to increase further due to supply bottlenecks, sustainability efforts and rising demand from industry. This will also support the transition to a circular economy.

- The availability of critical minerals is likely to have a significant influence on the pace of the energy transition. The supply dynamics of these minerals are expected to play a key role in how quickly and cost-efficiently the global economy can switch to renewable energy sources.

- States are actively striving to expand their commodity sources. This are doing so, for example, through a number of legislative measures such as the European Union's (EU) Critical Minerals Act. These measures aim to reduce dependence on individual sources and at the same time increase security of supply.

- It is crucial to analyse the capacity of future resources to meet the rapid increase in demand due to climate action initiatives. While some critical minerals, such as copper, present difficulties in this respect, others, such as lithium, are more readily available.

In summary, we believe that critical minerals are a key factor in the energy transition. In the spirit of sustainability, responsible mining is important to counteract negative social and environmental impacts. Comprehensive ESG integration in the investment process can address these concerns.

[1] Global Critical Minerals Outlook 2024, IEA https://www.iea.org/reports/global-critical-minerals-outlook-2024 (Download: 11.2.2025)

1 Critical minerals as the basis for the energy transition.

The decarbonisation of the economy aims to bring about the transition from “brown” fossil fuels to “green” renewable energy sources such as sun, wind, water and geothermal heat. The aim is to reduce greenhouse gas emissions and slow down climate change. Also pursued by governments, this transition relies on critical minerals, as they provide the basis for low-emission technologies and products.

At the same time, pressure on these resources is also increasing elsewhere. This is due to growing prosperity and economic growth, the advancement of digital technologies and increasing demand from developing countries.

The demand for these minerals used varies depending on the technology. Lithium, nickel, cobalt, manganese and graphite, for example, are crucial for battery performance. Rare earths are used for the construction of permanent magnets in wind turbines and electric motors.

And for the power grids large amounts of aluminium and copper are required, the latter being the cornerstone of all technologies related to electricity (see focus on copper, Section 3). A selection of the most important minerals for the energy transition is shown in the chart below:

Figure 1: Use of critical minerals for the energy transition.

	Copper	Aluminium	Nickel	Zinc	Manganese	Tin	Lithium	Cobalt	Graphite	Rare earths	Silicon	Silver	Platinum-grade metals	Steel	Chromium
Electric vehicles (EVs)															
Electrical networks (e.g. wiring, cables)	High	High				Medium						Low			
Electric motors (e.g. wiring, magnets)	High					Low				High		Low			
EV batteries	High	High	High	Low	Medium	Medium	High	High	High	High		Low			
Autonomous vehicles (e.g. sensors, circuits, semiconductors)	Low					Medium					High				
On-board computers (e.g. semiconductors)						Medium					High				
Vehicles (e.g. battery and engine housings, castings)		High			High									High	
Power generation															
Offshore wind power	High	Medium	Medium	High	Medium					High		Low		High	Medium
Onshore wind power	High	Medium	Medium	High	Medium					High		Low		High	Medium
Solar power (photovoltaic, PV)	High	High	Low	Low		Medium					High	High		Low	
Concentrated solar power (CSP)	Medium	High	Medium	Medium		Medium					High			Low	High
Water power	Medium	Medium	Low	Medium											Medium
Biomass	High	Medium	Low	Medium										Low	Low
Geothermal energy	Low	Low	High	Low										Low	High
Nuclear energy	Medium	Low	Medium	Low										High	High
Hydrogen/natural gas	High	Medium	High							Medium			High	High	
Energy infrastructure															
Charging infrastructure (e.g. charging connections, power cabling, transformers)	High	High		Medium		Medium						Low		Medium	
Grid infrastructure and electrical components	High			High		Low						Low		High	
Energy transmission and lines	High	High		High		Medium						Low		High	
Energy storage systems (ESSs)	High	High	High	Low	High	Medium	High	High	High	High		Low			
Further information															
Share of clean technologies in total demand by 2023/24	30%	15–20%	15–20%	5–10%	5–10%	5–10%	60%	30–40%	30–40%	20–25%	30–35%	20–25%	20–30%	5–10%	10–15%
Share of clean technologies in total demand by 2030E	40–45%	40–50%	40–50%	20–25%	20–25%	15–20%	80–90%	50–60%	60–65%	35–42%	60–70%	30–40%	30–35%	10–15%	20–25%
Share of secondary supply in total demand by 2023/24	30–33% (Recycling: 17–18%)	23–31%	33–34% (Recycling: 1–2%)	12–14%	<1%	15%	3%	10–11%	5–7%	20–25%	10–15%	15–17%	42–47% (Recycling: 18%)	28–29%	10–15%
Share of secondary supply in total demand by 2030E	32–36% (Recycling: 18–19%)	26–37%	37% (Recycling: 2–4%)	13–14%	2–3%	22%	5–10%	12–15%	10–15%	25–30%	20–25%	17–25%	49–53% (Recycling: 19%)	35–38%	15–20%
Major mining countries	Chile DRC Peru	Australia China Guinea	Indonesia Philippines New Caledonia	China Peru Australia	South Africa Gabon Australia	China Indonesia Myanmar	Australia China Chile	DRC Indonesia Russia	China Mozambique Madagascar	China Myanmar Australia	China USA Brazil	Mexico China Peru	South Africa Russia Zimbabwe	Australia Brazil China	South Africa Kazakhstan Turkey
Main refining countries	China Chile Japan	China UAE India	Indonesia China Finland	China South Korea Japan	China South Africa India	China Indonesia Malaysia	China Chile Argentina	China Finland Japan	China Japan USA	China Malaysia Australia	China Russia Norway	China Mexico Peru	South Africa Russia Zimbabwe	China India Japan	China Kazakhstan South Africa

● High ● Medium ● Low

Sources: Swisscanto, IEA, USGS, UBS, DB, GS, MS, BofA, ICSG, WoodMac, CRU.
Note: Secondary supply includes production waste, by-products and recycled material from end-of-life products/applications; EAEU = Eurasian Economic Union.

Three scenarios in the fight against climate change

The IEA’s forecasts are sobering. For example, the available amount of minerals required for clean energy technologies, such as copper, nickel, graphite, lithium, manganese and cobalt, would have to more than double in order to implement the **Stated Policies Scenario (STEPS)** or **Announced Pledges Scenario (APS)** expected in the fight against climate change. The STEPS scenario aims to give a sense of the prevailing direction of development in energy systems, based on a detailed review of the current political landscape. APS assumes that governments will fully or partially deliver on the promises made today. Here, the IEA forecasts a moderate increase in global temperature by 1.7°C by the year 2100.

Achieving the **Net Zero Emissions (NZE)** target by 2030 – the IEA’s most ambitious scenario – would even require tripling critical minerals. Measured against global economic growth, this may not seem particularly astronomical at first glance. However, it would mean that demand for these minerals would increase by around 12-19% each year until 2030. This surge in demand is likely to intensify global competition for resources and possibly lead to a shift where dependence on critical minerals reaches the degree of oil today.

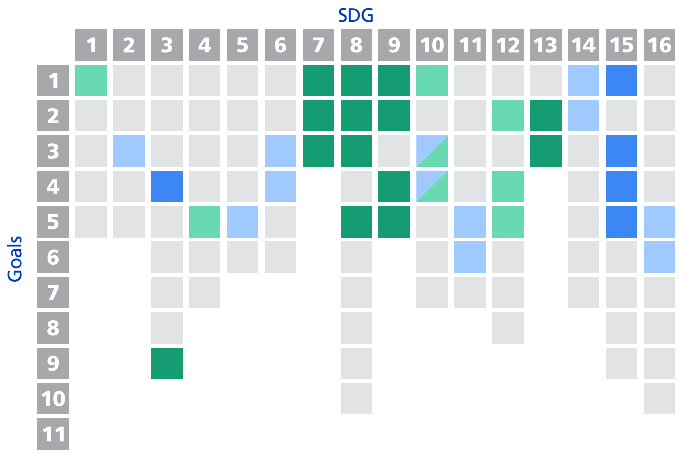
2 Decisive contribution to the SDGs.

The transition from fossil fuels to clean energy sources will likely depend heavily on critical minerals. As a result, these minerals also play a key role in achieving the Sustainable Development Goals (SDGs) set by the United Nations.

For example, critical minerals are expected to be crucial to address global challenges such as the transition from fossil to renewable energy or to accomplish electrification and industrial innovation. They can also promote clean energy, economic growth and job creation. As a result, critical minerals contribute to achieving several SDGs and the assigned targets (see Figure 2). However, if their local extraction and processing is not done responsibly, critical minerals may cause a variety of problems. In mining, for example, there is a danger of pollution and disruption to ecosystems. Waste, excavation and polluted seepage water, as well as deforestation, desertification, loss of biological productivity and abandoned sites frustrate progress towards some SDGs.

As the comparison (see Figure 3) shows, the positive contributions generally outweigh the negative impacts. All things considered, critical minerals are able to support the SDGs. In our view, SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure) and SDG 13 (Climate Action) are actually closely aligned. On the other hand, local mining can be detrimental to SDG 14 (Life below Water) and SDG 15 (Life on Land). Where quantitative criteria are in alignment, a holistic ESG integration is always conducted at company level. Only companies that demonstrate a positive approach to environmental, social and governance aspects are selected.

Figure 2: SDG mapping of critical minerals.



- **Critical minerals** do not **conflict** with **the UN Sustainable Development Goals (SDGs and SDG targets)** as products.
- In our view, these minerals offer the **highest positive alignment** with global challenges, especially with the SDGs Affordable and Clean Energy (7), Industry, Innovation and Infrastructure (9) and Climate Action (13). The extraction of raw materials can have a negative local impact on the SGDs Life below Water (14) and Life on Land (15).

Very positive contribution
Slightly positive contribution
No or only marginal contribution
Very negative contribution
Slightly negative contribution

Source: Swisscanto, Barclays, UBS, Kepler Cheuvreux, Sustainalytics

Figure 3: Positive contributions to SDGs predominate.

Positive contribution

SDG 13
Climate Action
SDG 9
Industry, Innovation and Infrastructure
SDG 7
Affordable and Clean Energy

Negative contribution

SDG 15
Life on Land
SDG 14
Life below Water

- Critical minerals are the **backbone** of the **energy transition** and enable the transition to **renewable energy** (e.g. wind and solar), **electric vehicles** and **infrastructure** (e.g. grids, transmission and charging).
- **These minerals** enable **optimal alignment** with global challenges, especially with **SDGs** in the following areas: Affordable and Clean Energy (7), Industry, Innovation and Infrastructure (9), and Climate Action (13).
- However, **local mining activities** may have a **negative** impact on SDGs for Life below Water (14) and Life on Land (15).

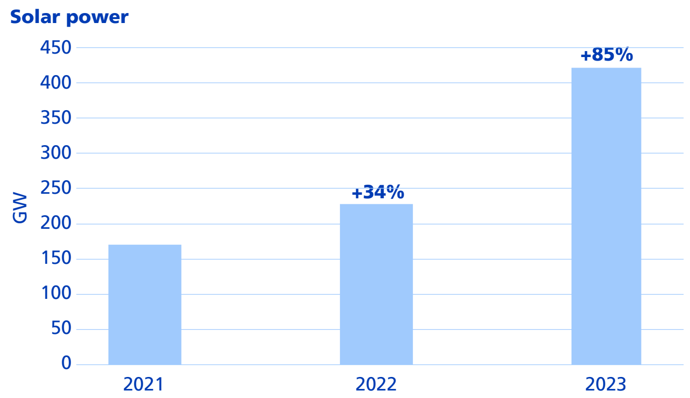
Source: Swisscanto, IEA

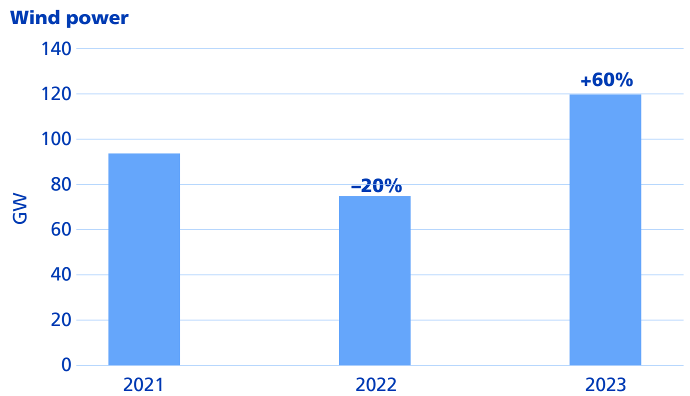
3 The investment theme and its main drivers.

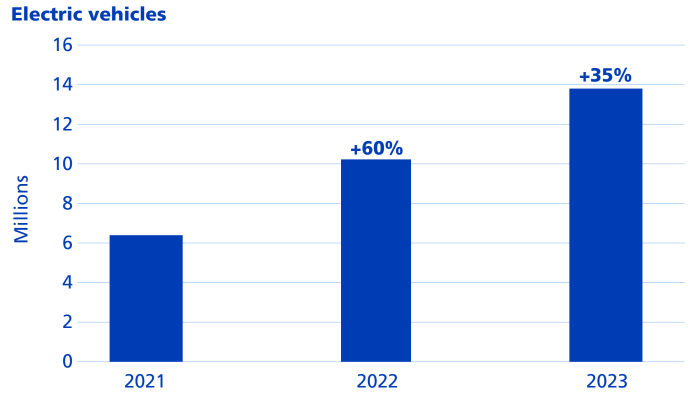
3.1 The vision of a net zero world depends on critical minerals

The rapid adoption of new technologies for the production of clean and renewable energy – such as solar power, onshore and offshore wind power – is leading to unprecedented demand for critical minerals, according to the IEA. For example, in 2023, the use of clean energy technologies reached an unprecedented level with annual growth of 85% in photovoltaics, 60% in wind turbines and 35% in EVs. Western developed countries and China continue to lead the way in the use of renewable energy, while most developing countries are still lagging behind.

Figure 4: Annual capacity expansion for clean energy technologies (in gigawatts, GW).



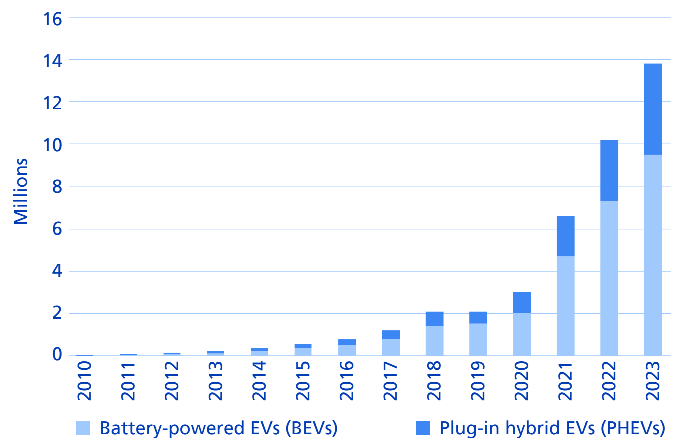


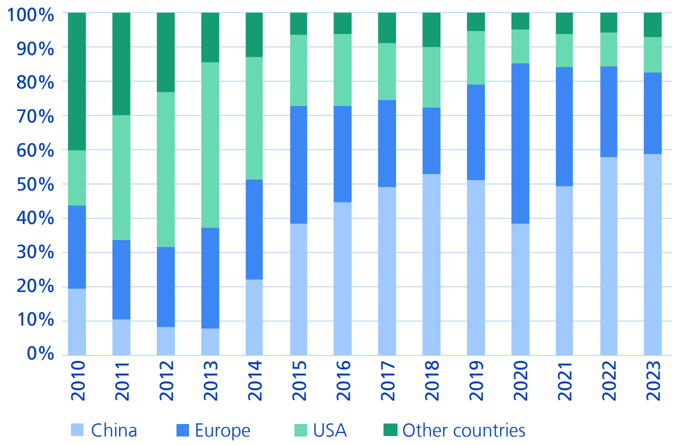


Source: IEA

The EV industry has also experienced enormous growth over the last five years. Sales already reached almost 14 million units worldwide in 2023. This represents growth of 35% compared to the previous year. Also in 2023, the share of EV sales in total automotive sales climbed to 18%. Five years earlier, the EV share was just 2%. China, Europe and the USA accounted for around 95% of total sales, with China still proving to be the most important sales market (approx. 60%).

Figure 5: Worldwide EV sales (in units).

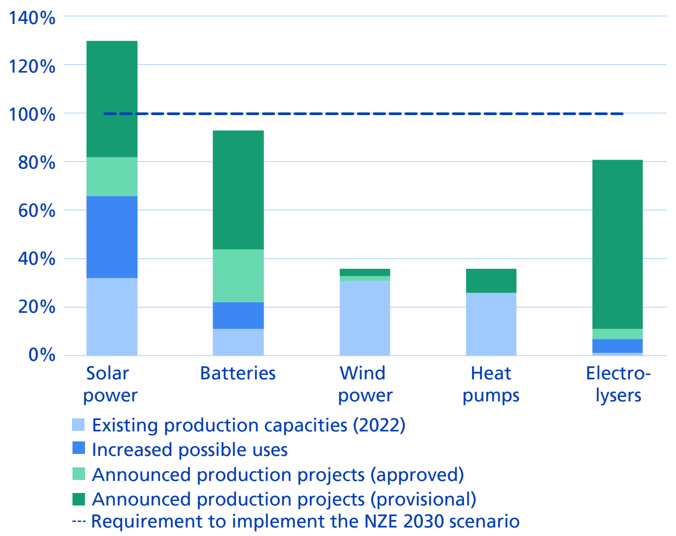




Source: IEA

The IEA, on the other hand, notes that the current and announced production capacities for PV and EV batteries are sufficient to meet the expected demand by 2030 even under the ambitious NZE scenario. At the same time, the market is tending to anticipate the STEPS or APS scenarios. However, there is a significant NZE capacity shortfall for heat pumps and wind turbines.

Figure 6: Where there are potential capacity shortfalls according to the NZE scenario.



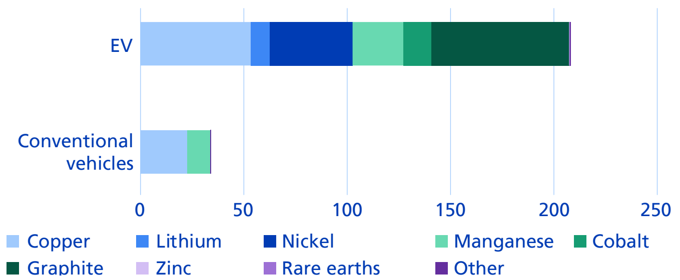
Source: IEA

3.2 "Clean" alternatives require more critical minerals.

Demand for these minerals will increase rapidly in all scenarios forecast by the IEA. As can be seen, photovoltaic systems, wind farms and electric vehicles generally require more critical minerals than competing products powered by fossil fuels.

For example, the construction of a typical electric vehicle requires six times more critical minerals than a conventional one, and 13 times more of these materials are used than in a gas power plant of comparable size. It is no coincidence that the average quantity of critical minerals required for a new unit of power generation capacity has increased by 50% since 2010.

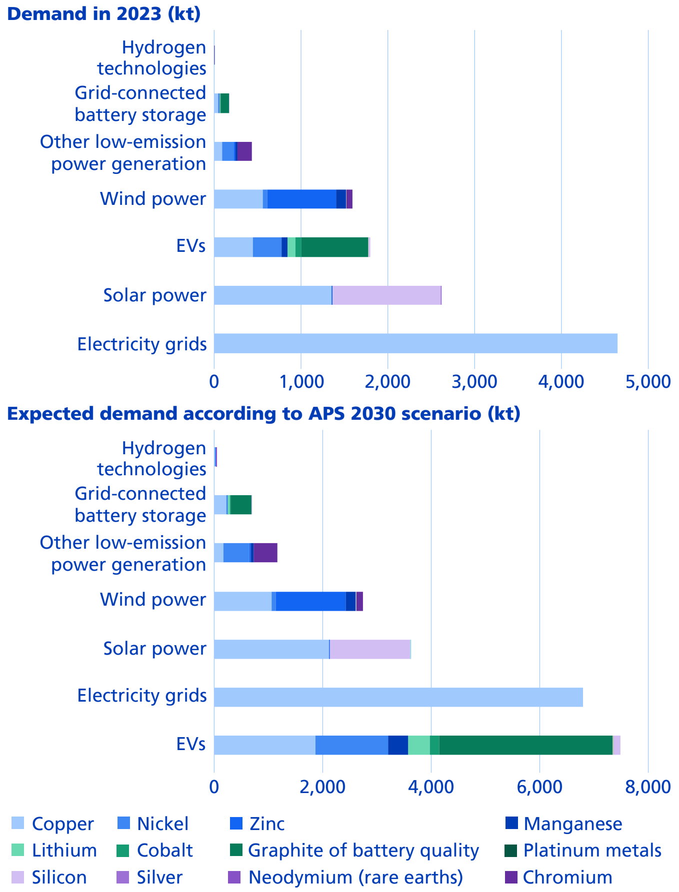
Figure 7: Consumption of critical raw materials in EV construction compared to conventional vehicles (in kg).



Source: IEA

The figure above shows that copper is the essential ingredient used in many of these applications applications (see also Figure 1 above), and particularly in power grids, renewables and EVs. In second place are materials that are used directly in batteries, such as graphite, nickel, manganese, cobalt and lithium. In turn, manganese, nickel and zinc are used to produce alloys for renewable energies such as photovoltaics and wind power, while silicon is the most important semiconductor material for solar cells and wafers. The magnets in electric vehicle engines and wind turbines are mainly made of neodymium, an important rare earth metal (REE).

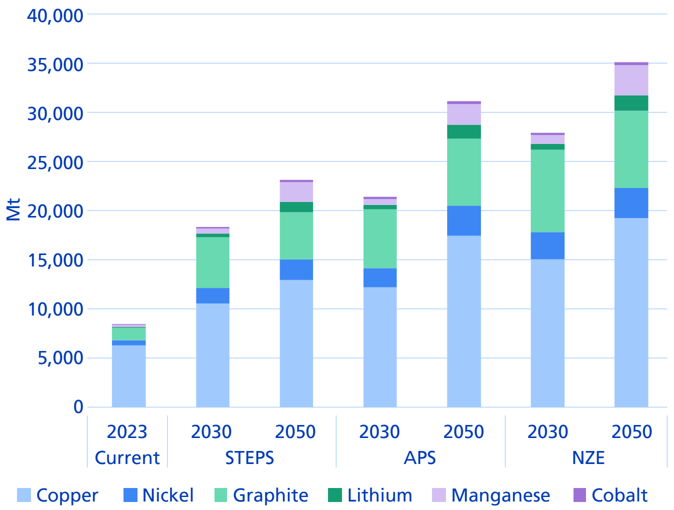
Figure 8: Use of critical minerals for clean energy technologies (in kt).



Source: IEA; note: this includes a subset of minerals, but excludes aluminium and steel.

Although the increased demand may not seem excessive at first glance, the demand for these materials is likely to increase significantly between 2023 and 2030. For example, according to the STEPS and APS scenarios, the supply of copper would have to increase by 8 to 10% annually by 2030 in order to meet the material demand for clean energy technologies. However, in the past, copper production has only increased by around 2 to 3% annually, in line with global growth in gross domestic product (GDP).

Figure 9: Demand for critical minerals for clean energy technologies according to IEA scenarios (in mt).



Source: IEA; note: this includes a subset of minerals, but excludes aluminium and steel.

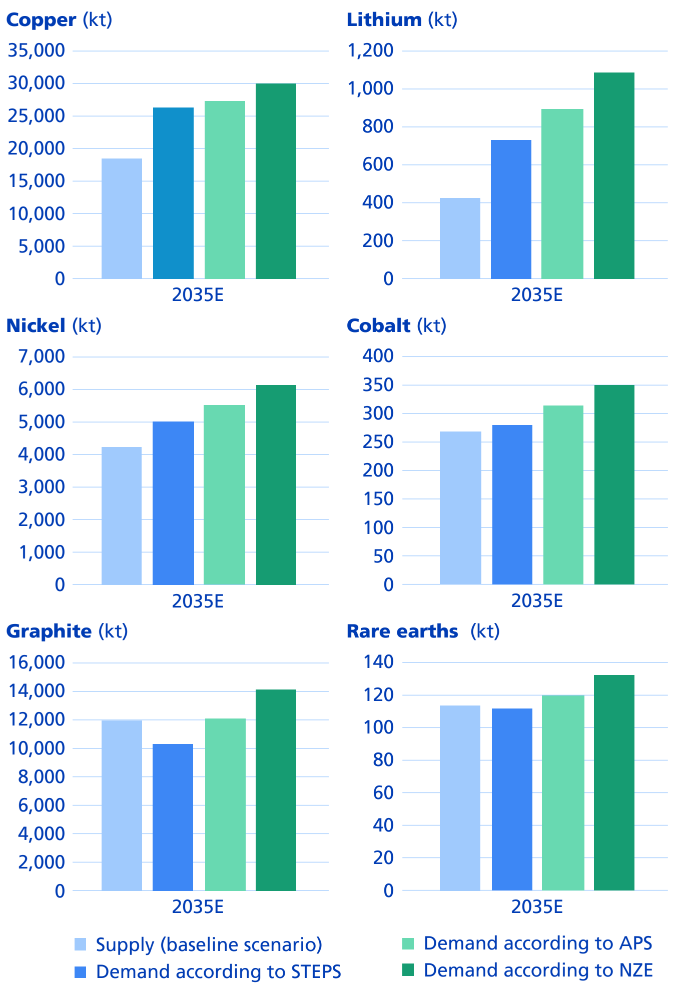
3.3 Availability of critical minerals sets the pace of the energy transition

The pace and costs of the energy transition will depend heavily on the availability of critical minerals in the future. The way in which these resources are supplied is also likely to determine the success of this paradigm shift.

The historical price behaviour of these minerals shows that they are highly volatile and subject to cycles. Short-term supply problems can lead to record prices, while high prices in turn have a normalising effect. This is because they allow unprofitable mines to suddenly generate a return again. This creates incentives to better exploit existing mines or commission new ones. As a result, the supply increases. As soon as this exceeds demand, prices fall. Although the reality of these price fluctuations is far more nuanced, supply and demand are the main factors in the pricing of minerals.

Projections for scenarios up to 2035 may seem distant, and they are certainly not set in stone. But what about supply and demand today and in 2035?

Figure 10: Equilibrium of supply and demand by 2035 (in kilotonnes, kt).



Source: IEA; note: the IEA does not create scenarios for aluminium.

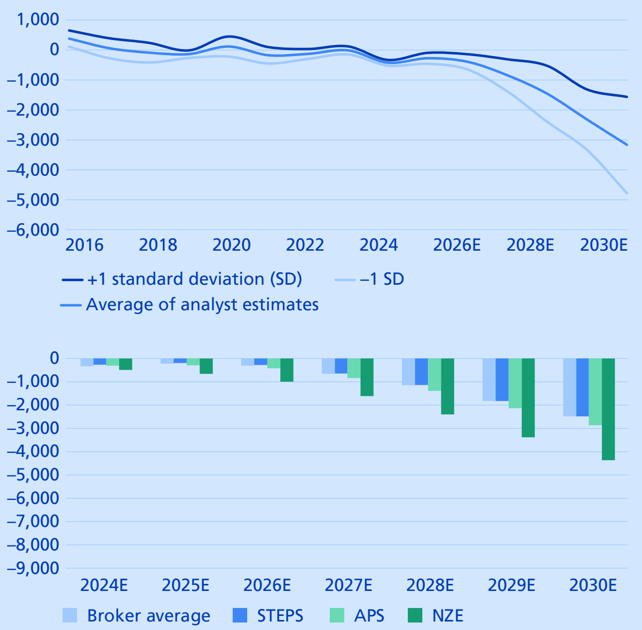
According to the IEA, it is very likely that the metals copper, lithium and nickel will be undersupplied in all three scenarios by 2035. In contrast, there seems to be a slightly greater balance between supply and demand for rare earth metals and graphite. The above three metals are considered to be undersupplied in the NZE scenario.

The only metal currently traded in deficit is copper. The remaining metals have either a slight or a high surplus.

At first glance, this indicates limited potential. But it is important to remember that commodities move in cycles. In other words: lower prices usually trigger a supply reaction that drives prices up again.

Focus on copper
According to the IEA's scenarios, the market expects a worsening shortage of copper. It is interesting to note that the market is currently pricing in a scenario that is more in line with STEPS than NZE. This suggests that market participants tend to expect global temperatures to rise by 2°C by 2050. However, it is also conceivable that the market strongly underestimates the probability of achieving the 1.5°C target according to the NZE scenario.

Figure 11: The equilibrium for copper.



Sources: Swisscanto, IEA and various brokers; note: unit in kilotonnes (1,000 metric tonnes).

Regardless of the IEA's scenarios, copper is expected to move towards structural deficit. The following drivers are expected here in the short and long term:

Structural lack of investment (long-term effect): Exploration activity has declined significantly over the last 10 years. It usually takes about 10 to 15 years from initial discovery to extraction. There are only a few profitable projects; most new major projects are not expected to start until the 2030s.

- **Decreasing content (long-term effect):** The average content of copper ore has decreased significantly since the last century. Nowadays, the average is below 1%. The consequences are clear: lower contents require higher input costs to extract the same amount of copper.

- **Strong demand as a result of the energy transition (long-term effect):** The transition to clean and renewable energy is driving demand for copper. EVs require three times as much copper as vehicles with combustion engines. Energy infrastructure, transmission, grid capacity and solar cells also contribute to this demand.

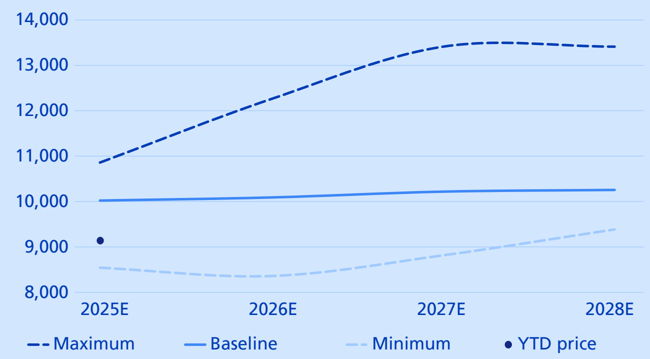
- **Supply interruptions (short-term effect):** In regions with high copper deposits such as Latin America and Central Africa, some states are not particularly stable in political or economic terms. Supply interruptions are therefore not uncommon. Examples include strikes in Peru and Chile or the closure of the largest copper mine in Panama in 2023.

- **Low visible stock levels (short-term effect):** For example, inventories for 2025 are developing similarly to 2022. In the first quarter, they were characterised by an increase in demand due to replenishments, which is particularly common in China. However, compared to the last five years, stock levels are still lower than before the coronavirus pandemic.

- **Speculation (short-term effect):** In January 2025, for example, speculators significantly increased their positions compared to the previous month, resulting in the largest monthly net increase since January 2022. Short-term demand for copper remains robust, mainly due to stable infrastructure projects in China.

In addition, demand is supported by a reduced production forecast from mining companies and a very tense contract market.

Figure 12: Price forecast for copper (in USD per metric tonne).



Sources: Swisscanto and various brokers

3.4 Closing the loop: the important role of secondary supply and recycling.

The secondary supply of critical minerals is expected to increase due to supply bottlenecks, sustainability efforts and rising industrial demand. The following terms are required to understand the topic of secondary supply[2]:

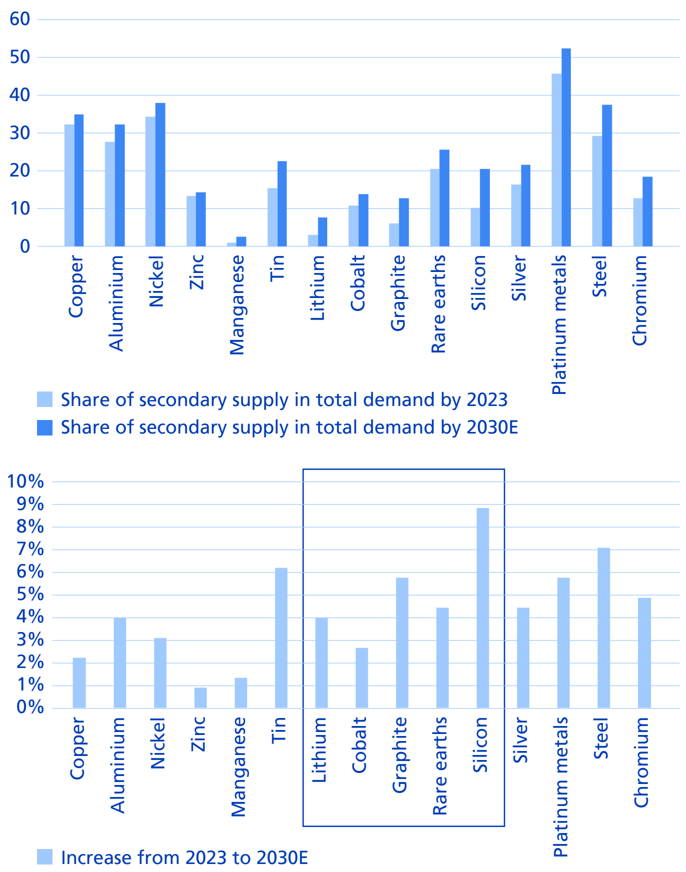
- **Secondary material** is a broad term for materials that have previously been used in one or more products and are returned to the supply chain. These materials can come from various sources: such as from production waste, by-products or recycled material from end-of-life products or applications. The secondary materials are collected and processed in the production of new products. This helps to reduce the need for newly extracted primary material.

- **Recycled material** is understood as a subset of secondary material; this refers to those substances that are collected, processed and converted into new materials. Typically, they go through a recycling process that includes sorting, cleaning and reprocessing. The quality

[2] Secondary supply = production waste + by-products + recycled material from end-of-life products or applications.

of recycled materials can sometimes be lower than that of primary materials. However, technological advances have continued to improve the quality of recycled materials.

Figure 13: Share of secondary supply and expected increase.



Sources: Swisscanto, IEA, UBS, BofA, DB, GS, CRU

The secondary supply of copper, for example, is currently relatively high, but is only expected to increase slightly by 2030 due to its use in durable products such as electrical networks and buildings. However, an increase is expected when the first major wave of EVs reaches the end of its life cycle; from this point onwards, secondary supply becomes crucial as growth in primary supply is limited (see above: focus on copper). Similar mechanisms apply to the EV base materials lithium, cobalt, graphite, rare earths and silicon.

For aluminium, secondary supply could increase more as the industry strives to reduce its CO_2 footprint due to high energy consumption in primary production. The secondary supply of nickel is expected to increase due to battery recycling. The secondary supply of zinc remains low and only minimal changes are expected, despite some recycling of steel dust. Manganese, on the other hand, is hardly reused due to the abundance of primary resources, making recycling economically impractical. In contrast, increased recycling efforts are being made to meet demand for the currently relatively scarce metal tin, the most important material for soldering.

The secondary supply of silver is expected to increase due to its high value and scarcity. Despite their scarcity, the secondary supply of platinum metals will probably only increase slightly due to the difficult demand situation. The secondary supply of steel could increase sharply due to the proliferation of EAF/DRI processes, particularly in Europe and Asia, whereas the USA already has high EAF penetration. The relatively high secondary supply of chromium is due to its significant use in stainless steel production, where significant recycling efforts are also undertaken.

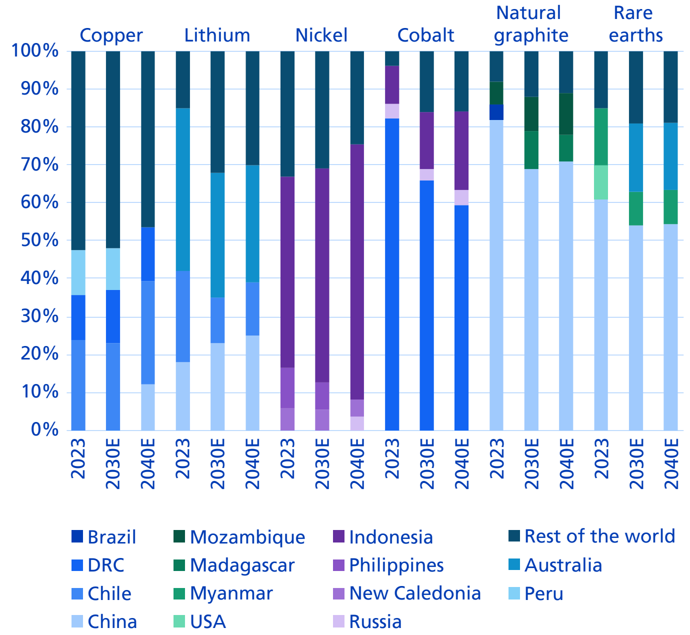
3.5 Problematic resource dependence on a few countries.

Geographical constraints have a significant impact on commodity procurement, as resources are often concentrated in few regions. This limits importing countries' ability to diversify their supply chains. The distribution of commodity deposits varies by commodity, with some resources being more geographically diversified than others. For example, at first glance, copper extraction is relatively widely scattered across the globe. However, a closer look shows that Chile alone accounts for more than 20% of supply.

In contrast, nickel and cobalt are much less distributed geographically. Indonesia supplies around 50% of the world's nickel, while the Democratic Republic of the Congo (DRC) produces around 60% of the world's cobalt supply. Similarly, natural graphite and rare earths are highly concentrated, with China controlling 80% of natural graphite and 60% of rare earth production.

This concentration of supply creates vulnerabilities in global supply chains, making them vulnerable to geopolitical and economic disruptions. As a result, strategic planning and international cooperation are essential from the perspective of the stakeholders involved in order to manage the inherent risks and ensure stable supply.

Figure 14: Geographical distribution of the production of mined critical minerals.

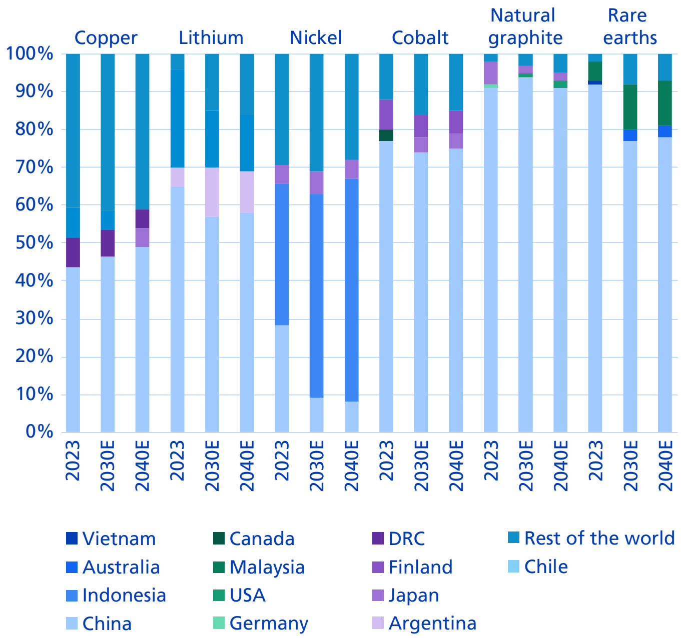


Source: IEA

On the processing side, concentration is even more pronounced, with China dominating the global landscape (see Figure 15). In an effort to gain strategic access to minerals, the People's Republic has aggressively invested in upstream and downstream facilities in Africa and Latin America.

According to the IEA, Chinese companies invested around USD 4.3 billion in the acquisition of lithium deposits between 2018 and 2021, twice as much as US, Australian and Canadian companies combined. This makes China not only the world's largest consumer of many minerals, but also the leading refinery operator.

Figure 15: Geographical distribution of the production of refined critical minerals.



Source: IEA

The need for a sustainable and secure supply of critical minerals has driven governments around the world to act. Notable initiatives include the EU's Critical Raw Materials Act (CRM), the USA's Inflation Reduction Act (IRA), Australia's Critical Minerals Strategy and Canada's Critical Minerals Strategy.

On the other hand, some countries have imposed restrictions on the import and export of these raw materials. For example, resource-rich countries such as Indonesia, Namibia and Zimbabwe have banned the export of unprocessed mineral ore. These restrictions aim to promote value creation in the respective country and to control resource management.

4 Critical minerals – also interesting from an investor's perspective.

Investing in companies operating in the critical minerals sector, for example through investment funds, can be interesting for the following reasons, especially in times of supply constraints:

- **Strong demand growth:** As clean energy technologies are promoted globally, the demand for critical minerals grows. This creates significant growth potential for investments in sectors that mine, refine and supply these materials.

- **Supply bottlenecks:** Supply deficits can drive up prices for these minerals. Limited supply due to geopolitical tensions, new environmental protection regulations or technical challenges in mining and processing can lead to higher raw material prices. This benefits the holders of these assets.

- **Hedging against inflation:** Critical minerals can be used as a hedge against inflation. In times of high inflation, the value of tangible assets tends to rise, which can protect the real value of capital.

- **Sovereign support and regulation:** Many governments support the transition to clean and renewable energy sources through subsidies and regulations. The mining and processing industries can also benefit from these policies.

- **Trend towards more sustainability:** Increasing investor interest in sustainable and responsible investments can have a positive impact on the price of materials that are crucial for renewable energy.

- **Diversification:** Investments in critical minerals can contribute to portfolio diversification. As their performance is often determined by factors other than those of traditional equity and bond markets, they can reduce the total risk of the portfolio.

- **Geopolitical importance**: Critical minerals have are of paramount strategic importance. If investments are in line with important national and geopolitical interests, this can provide additional stability to the investment.

Positive case study: Ivanhoe Mines
Ivanhoe Mines is a Canadian mining company focused on the exploration, mining and production of copper and a variety of other minerals. As of March 2025, the company has reached a market capitalisation of around USD 13.3 billion. Net profit in 2024 was USD 229 million (USD 513 consensus estimate for 2025E) and annual copper production was 437 kilotonnes (kt) in 2024 (consensus estimate for 2025E: 564 kt).

The mining regions are primarily located in Africa. The company's most important projects include the Kamoa-Kakula copper complex in the Democratic Republic of the Congo (DRC). It is known as one of the fastest growing and highest-quality copper mines in the world. In addition, there is the Platreef project in South Africa, an important source of platinum-grade metals (PGMs) and nickel. The Kipushi project, which is currently in the start-up phase, is another important zinc mine in the DRC.

Quality of resources: The company's Kamoa-Kakula copper complex is known for its high-quality deposits. With an impressive copper content of around 5.5% (the global average is below 1%), it is one of the world's highest-quality large copper mines. The expected lifespan of the mine is over 40 years. The company also prioritises exploration, with ongoing projects at Makoko and Kiala in the DRC.

These expansions underline the company's robust growth option that should make Ivanhoe Mines one of the world's leading copper producers both in the near term and in the coming decades.

Quality of the company: Ivanhoe Mines is a positive example of comparatively high company quality in the mining sector, characterised by strong management led by founder Robert Friedland. The company's balance sheet is robust and has a low debt ratio. Ivanhoe Mines has consistently achieved increasing margins over the years, which also underlines its operational efficiency. Due to the high growth potential, high resource quality and favourable sales forecasts for copper, the return on investment capital (ROIC) profile looks very favourable.

The company is also well-positioned in the growth trend triggered by the global energy transition and leads the sector's cost curve thanks to comparatively high-quality and cost-effective operations. All of this strengthens Ivanhoe Mines' competitive advantage and opens up excellent prospects for the company's future in the mining industry.

- We assess the company's ESG performance using our own SDG and ESG assessment framework, consult with external providers and conduct regular discussions with the obsolete management itself. This engagement includes virtual and physical meetings as well as on-site visits, which are particularly valuable from an investor perspective. Based on our assessment, we conclude that Ivanhoe Mines is pursuing sustainable mining practices to supply key metals for the global energy transition.

Summary

The decarbonisation of the economy depends heavily on renewable energy sources such as sun, wind, water and geothermal energy. Consequently, minerals that serve as the basis for clean energy technologies are of crucial importance. This applies in particular to the supply of critical minerals such as lithium, nickel, cobalt, copper and rare earths. These minerals are the foundation for technologies that drive the energy transition; EVs, wind turbines and solar cells all rely on them. Consequently, as clean energy technologies become more widespread, demand for critical minerals is expected to rise substantially.

From an investor's perspective, investments in critical minerals or in companies that extract or process them can offer various opportunities. In our opinion, these include comparatively high growth potential, inflation protection opportunities and portfolio diversification. The strategic importance of these minerals is now recognised worldwide, and many governments are implementing measures to ensure sustainable and stable supply. Against this backdrop, investors have the opportunity for rising price trends, which could result from supply deficits and the growing need for sustainable energy solutions, which is also politically driven.

Legal notices