

Will more electric vehicles mean more mining?

The rapid deployment of electric vehicles (EVs) over the past decade has driven a substantial increase in demand for materials used in EV batteries and electric motors, such as lithium, nickel, cobalt and rare earths used in magnets (neodymium, praseodymium). Total demand for critical minerals grew by more than 30% between 2015 and 2024. Despite this, they represent only a small share of global extractive activities, which also include mining for construction materials, iron ore, bauxite, gold and fossil fuels. In 2024, around 8 billion tonnes of critical mineral ores were mined, of which around 320 million tonnes were related to EV batteries and motors. For reference, more than 100 billion tonnes of fossil fuels were extracted during the same year, mostly coal and oil. Within critical minerals, copper dominates mining volumes, accounting for roughly 85% of the total by mass, of which roughly 2% was used for EVs in 2024.

While growth in EVs increases critical mineral demand (as does growth in renewables), it also reduces fossil fuel use, leading to a net decline in total extraction over time. Between 2024 and 2035, combined fossil fuel and critical mineral extraction decline marginally in the Current Policies Scenario (CPS) and fall by more than 10% in the Stated Policies Scenario (STEPS), and by over 40% in the Net Zero Emissions by 2050 Scenario (NZE Scenario). Overall, the greater the deployment of technologies like EVs and renewables, the lower the extraction needs.

Importantly, critical minerals can be recovered through recycling – in the STEPS, battery recycling could meet 10-20% of lithium and nickel demand and over 30% of cobalt demand by 2050. This is in contrast to the vast majority of fossil-fuel-derived products, which cannot be recycled and are instead irreversibly consumed.

The switch to EVs can reduce both lifecycle emissions and long-term extraction volumes, but the local impacts of extractive activities must not be overlooked. If not responsibly managed, mining can damage local biodiversity, affect indigenous communities, and pollute land and water resources. Minimising these impacts is essential from both an ethical and a strategic standpoint – strong local support is critical to securing long-term, stable operations. Developing new mines requires many years to obtain permits and start production. Gaining and maintaining community trust is therefore central to the security and resilience of mining assets.

RAW MATERIAL EXTRACTION BY SCENARIO IN BILLION TONNES

