

Mining

The Big Dig: Germany reopens its mines in quest for mineral self-sufficiency

Berlin wants to reduce its dependence on China by extracting more critical raw materials, such as fluorspar, at home

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The Käfersteige mine on the fringes of the Black Forest has lain dormant for 27 years, its rich mineral deposits abandoned, its gates locked and its tunnels immersed in floodwater.

Now those gates are about to reopen, as Germany seeks to reduce its dependence on imported critical minerals by extracting more of them itself.

“If we really want a revolution in transport and the resources needed for that, there’s no way around this project,” said Simon Bodensteiner, chief executive of Deutsche Flussspat, the German start-up planning to reactivate the mine. “And we are as good as ready to go.”

Käfersteige sits atop what is believed to be Europe’s largest deposit of fluorspar, a crucial component of electric cars. Every battery in a Volkswagen ID.4, the company’s first electric SUV, requires about 10kg of the mineral.

Germany currently imports large quantities of it from Mexico. The dream is of greater self-sufficiency, not only in fluorspar – often nicknamed “lithium’s little brother” – but other commodities the country needs for its green transition.

“We should use the potential we have and prove that green and sustainable mining is possible,” said Franziska Brantner, state secretary at the economy ministry, who is spearheading Berlin’s efforts to make its supply chains more resilient. “Historically speaking, Germany has always been a country that produces raw materials.”

Since the Covid-19 pandemic, western governments have been rushing to safeguard their economies from disruptions to trade, through everything from “friend-shoring” – moving supply chains to trusted countries – to outright decoupling from China.

Fears of an east-west conflict over Taiwan have only intensified the desire of the US and Europe to reduce their reliance on China for a host of critical materials. The EU, for example, depends on China for 72 per cent of its rare earth metals, a crucial component of computers, mobile phones and electric cars, according to Germany’s raw materials agency Dera.

Scarred by the turmoil caused by Russia’s suspension of gas exports to Europe after its full-scale invasion of Ukraine, business leaders say Germany must move quickly to avoid falling into the same trap with China.

“We are already more reliant on China for certain metals than we were on Russia for gas,” said Matthias Wachter of the BDI, Germany’s main business lobby. “And that’s a huge risk.”

Data compiled by Dera shows how dependent Germany and Europe have become on a small group of suppliers. In 2021, the EU received 96 per cent of its fluorspar from Turkey, 98 per cent of its nickel oxide from Russia and 83 per cent of its gallium and germanium from China.

The market for fluorspar is also highly concentrated: only a small number of countries export it, and Europe’s domestic production covers just a third of its demand for the mineral, according to Bodensteiner. “Prices have steadily increased over the past 20 years as China reduced exports, existing mines became depleted and few new mines were opened,” he said.

Germany’s response has been to overhaul its raw materials strategy, with an eye to beefing up the role of the state in securing critical supplies. Brantner has been instrumental in drafting the strategy, an early version of which was released in January.

The paper says that the inadequate supply of critical materials such as lithium, copper and rare earths poses a “significant risk” to achieving global climate goals. It sees a possible solution in a public-private “raw materials fund” to support mining, processing and recycling projects in Germany and the EU with grants, loans and investment guarantees.

It also floats the ideas of increasing investment in recycling, creating a state stockpile of strategic raw materials and establishing “minerals security partnerships” with exporters such as Canada and Australia, as well as expanding domestic production.

The EU is also reassessing its approach. It has produced a Critical Raw Materials

Act that will set quotas for domestic production of minerals and lower regulatory barriers for miners. Fluorspar is one of 34 commodities listed as critical.

The revival of Käfersteige, situated in a heavily wooded area near the town of Pforzheim, a jewellery and watchmaking centre in south-western Germany, epitomises the renewed interest in exploiting the country’s mineral wealth.

The mine first went into operation in 1935, at a time when fluorspar’s main use was in the metals industry: it lowers the melting temperature in steel and aluminium production and so improves energy efficiency.

But in the 1990s the industry fell into crisis. The market was flooded with a wave of Chinese-produced fluorspar that drove prices below the dollar-equivalent of €100 a tonne. Käfersteige’s then owner, Bayer, closed the mine in 1996.

Since then, prices have surged, rising to an all-time high of €700 per tonne in the summer of 2022 as demand for the mineral – used in solar modules and lithium-ion batteries – soared. (It has since fallen back to about €560 per tonne).

Projections by Deutsche Flussspat suggest EU demand for fluorspar concentrate could rise from 755,000 tonnes a year in 2020 to around 1.1mn tonnes by the end of the decade, if carmakers in the bloc use battery compounds sourced in Europe to achieve their CO₂ emissions targets.

Käfersteige, which is reported to contain about 2mn tonnes of raw fluorspar, could produce 100,000 tonnes a year after 2029, meeting 40 per cent of Germany’s demand and 13 per cent of the EU’s, according to Bodensteiner.

It is not the only new mining project in Germany. London-listed Zinnwald Lithium is planning to mine a huge lithium deposit on the German-Czech border in Saxony, while Vulcan Energy Resources aims to produce lithium from thermal water in Oberrheingraben, near Karlsruhe in south-west Germany.

Some experts think the focus on extracting raw materials is too narrow, however. “Mining alone is

The EU is dependent on Russia, China and Turkey for critical minerals

Supplier	Country risk	Material	Share of EU total supply (%)
Russia	High	Nickel oxide	98
China	Medium	Cobalt oxide and hydroxide	97
Turkey	Medium	Feldspar	96
Turkey	Medium	Boron minerals	95
China	Medium	Manganese products	93
Turkey	Medium	Antimony ore	92
China	Medium	Magnesium	92
Russia	High	Chrome	90
China	Medium	Gallium	83
China	Medium	Germanium	83
Brazil	Medium	Ferroniobium	81
Turkey	Medium	Borax	80
China	Medium	Bismuth products	80
Serbia	Medium	Copper powder	75
China	Medium	Synthetic graphite	73
China	Medium	Rare earth metals	72
China	Medium	Tungsten	71
India	Medium	Mica	70
South Africa	Medium	Chromite	70
China	Medium	Diamond powder	69
Russia	High	Ferro-titanium	68
China	Medium	Barium sulphate	65
China	Medium	Manganese dioxide	65
China	Medium	Iridium	65
Turkey	Medium	Magnesite	64
Russia	High	Iron production through direct reduction	61
China	Medium	Synthetic corundum	59
China	Medium	Antimony oxide	57
Australia	Low	Lead	57
Russia	High	Monoammonium phosphate	56
US	Low	Tantalum	56
Uzbekistan	High	Molybdenum	56
India	Medium	Talcum	55
South Africa	Medium	Rhodium	55
Morocco	Medium	Diammonium phosphate	55
US	Low	Nickel alloys	53
Kazakhstan	Medium	Chrome oxide and hydroxide	53
South Africa	Medium	Platinum	52
China	Medium	Fused magnesia	51
Guinea	High	Bauxite	51
Russia	High	Ferro-tungsten	50
South Africa	Medium	Aluminium silicate	50
China	Medium	Nickel oxide and hydroxide	49
Morocco	Medium	Phosphoric acid	49
China	Medium	Tantalum products	48
US	Low	Molybdenum ore	48
Canada	Low	Nickel ore	47
Gabon	High	Manganese ore	47
Russia	High	Cerium compounds	46
Russia	High	Industrial diamonds	46
Mexico	High	Fluorspar	45
South Africa	Medium	Ferrochrome	45
Tajikistan	High	Antimony	44
Norway	Low	Silicon	44
South Korea	Low	Ferromolybdenum	44
Indonesia	Medium	Tin	41

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Source: DERA

not enough,” said Siyamend Al Barazi, an expert at Dera. “We need to start thinking in complete value chains again, and that means processing as well as mining.”

It is an approach, he said, that underpins the US Inflation Reduction Act, which lavishes billions of dollars in subsidies on green technologies.

Yet business conditions in Germany – especially the high cost of electricity – are

hardly conducive to large-scale investment. “If we can’t offer competitive energy prices for mineral processing, which is highly energy-intensive, then it’s going to be hard for Europe,” Al Barazi added.

Wachter, of the BDI, argued that some of the hype about a potential domestic boom in critical materials was overdone. “The idea that Germany can become self-sufficient is unrealistic,”

he said. “But some of the raw materials we need can, indeed, be produced here. And that gives us a big advantage.”

The chart in this article has been amended since publication. It originally had two entries for Turkey’s Feldspar supplies.