

Achieving net zero while lessening reliance on China

The example of minerals used in electric vehicle batteries

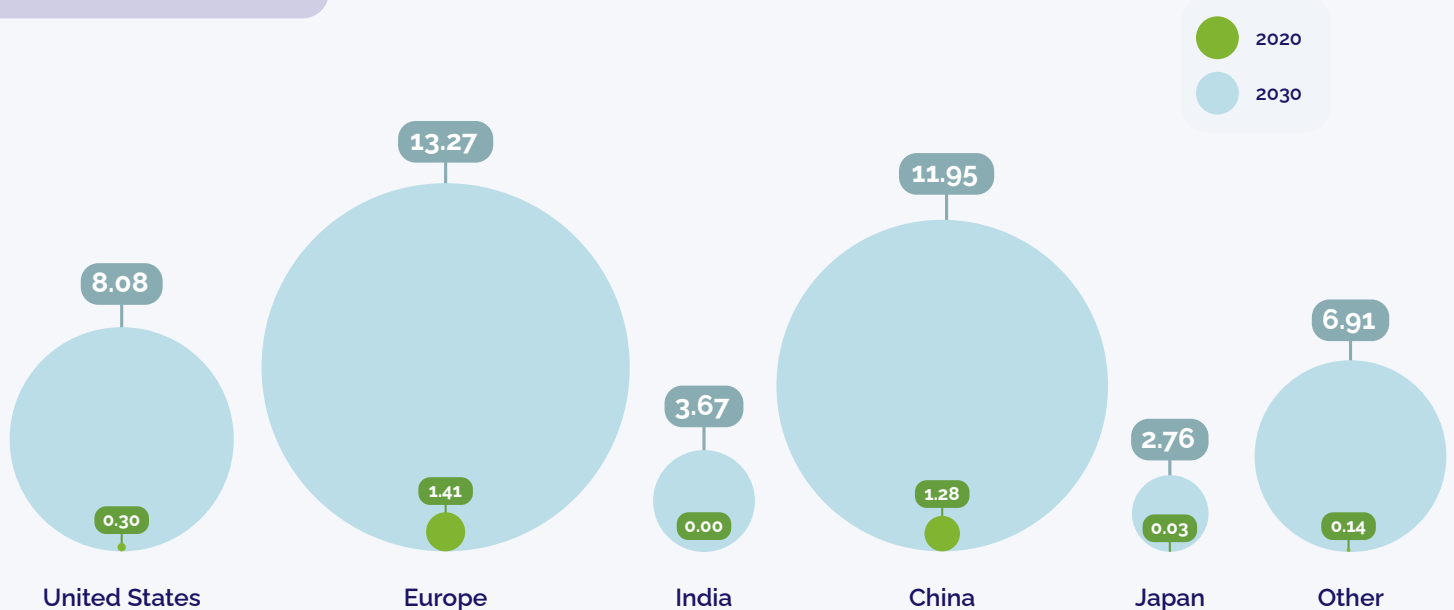
The European Union is no longer alone in its pursuit to achieve carbon neutrality by 2050. Many countries have joined the global race to dominate green technologies, creating extraordinary demand for the minerals needed to produce them. Contenders in the race to net zero must diversify their supply chains in order to ensure access to these strategic raw materials and get to a position where, instead of having to rely on imports of green technologies, they can sell abroad.

The example of battery production supporting society's transition to electric vehicles demonstrates how reliant the world has become on China's refining services for the primary minerals used in batteries, and highlights the risk of growing dependence on imports of Chinese electric vehicles.

In addition to recycling efforts, the diversification of strategic mineral supplies calls for expanding extraction capabilities in Europe and treating the ratification of certain trade agreements as a security issue.

1 The global market for electric vehicles is booming

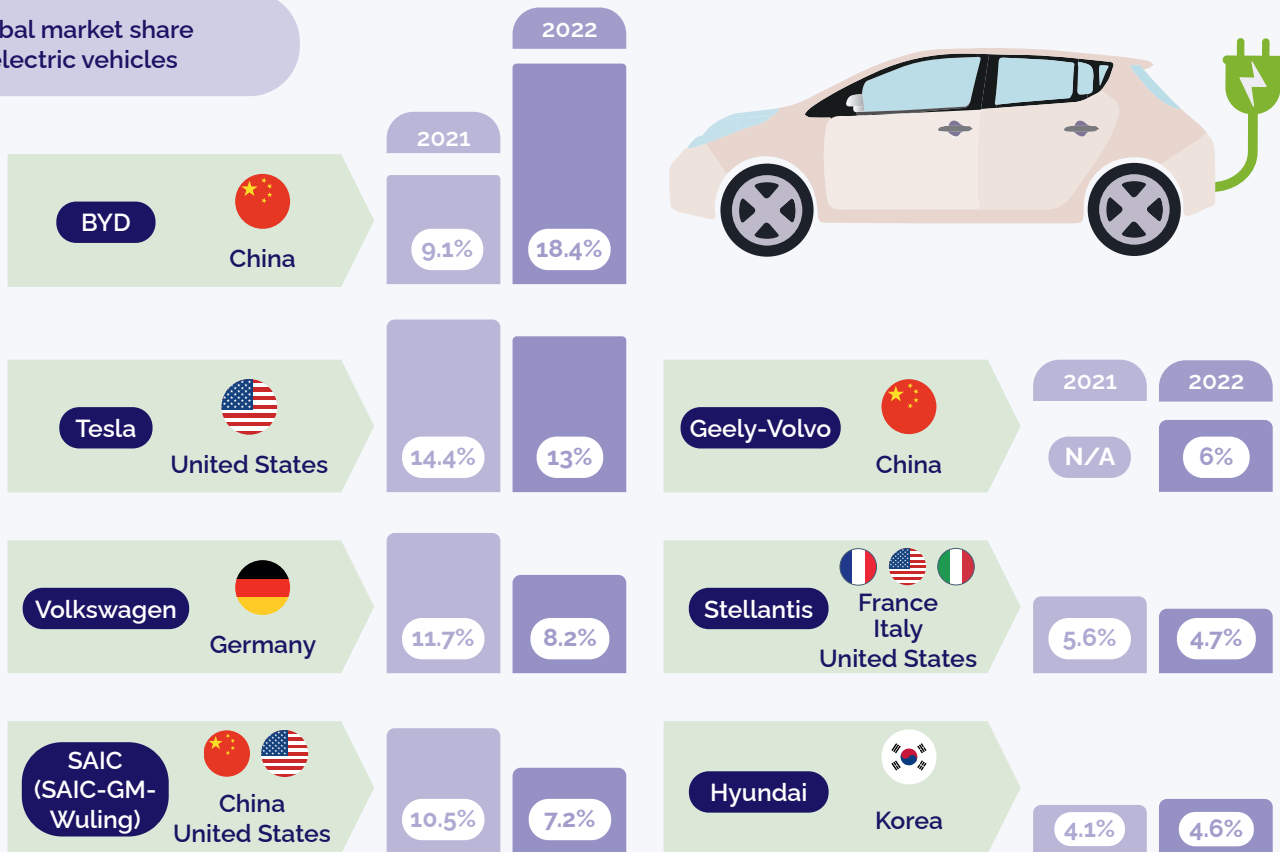
In millions of units sold



Source: International Energy Agency 2022.

2 Leading electric vehicle manufacturers 2021-2022: competition from China is intensifying

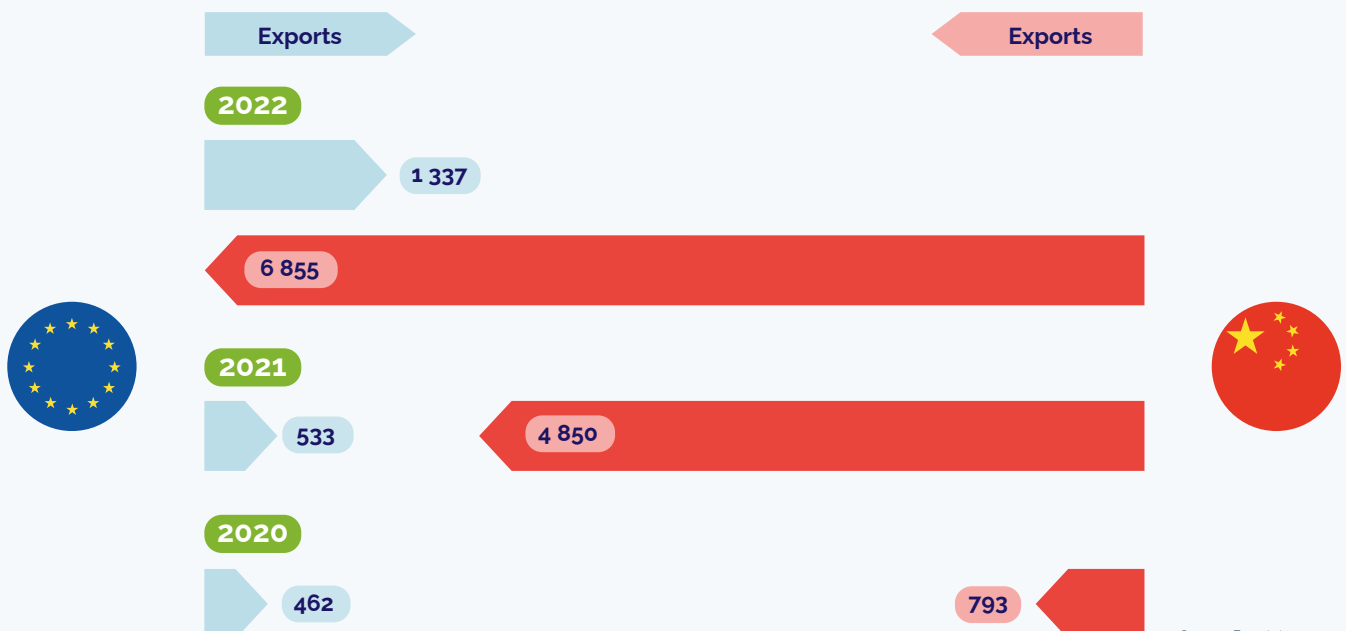
Global market share of electric vehicles



Source: InsideEVs, February 2023.

3 EU imports of Chinese electric vehicles are rising sharply

Exports (in million EUR) between the EU and China of electric vehicles for less than 10 passengers.

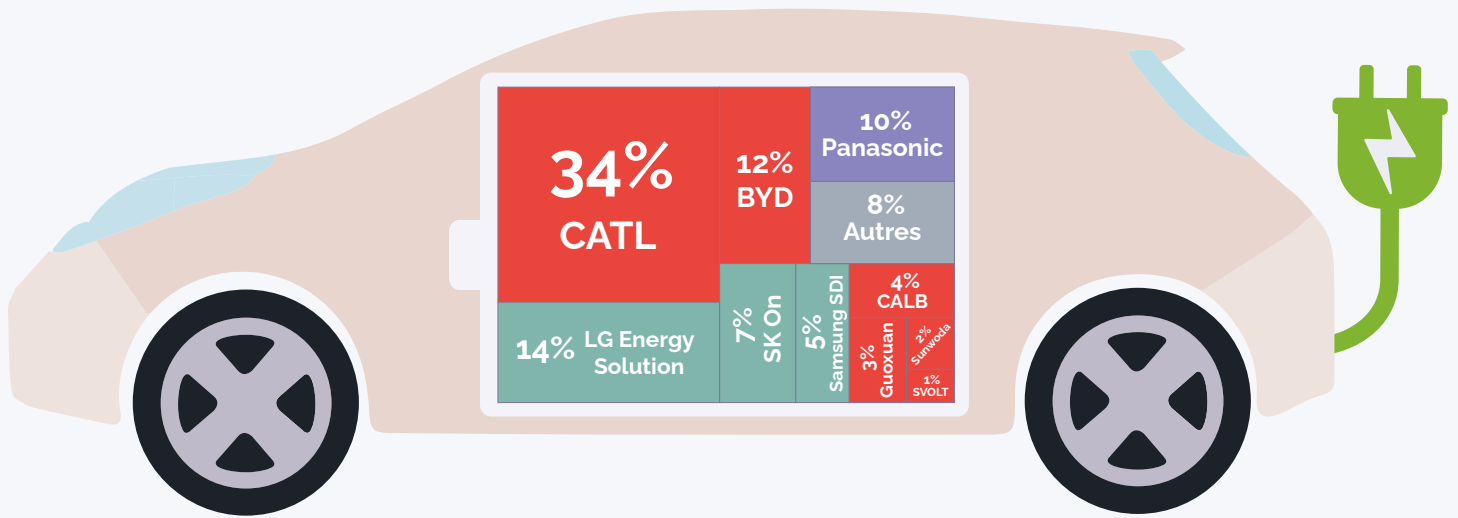


Source: Eurostat 2022.

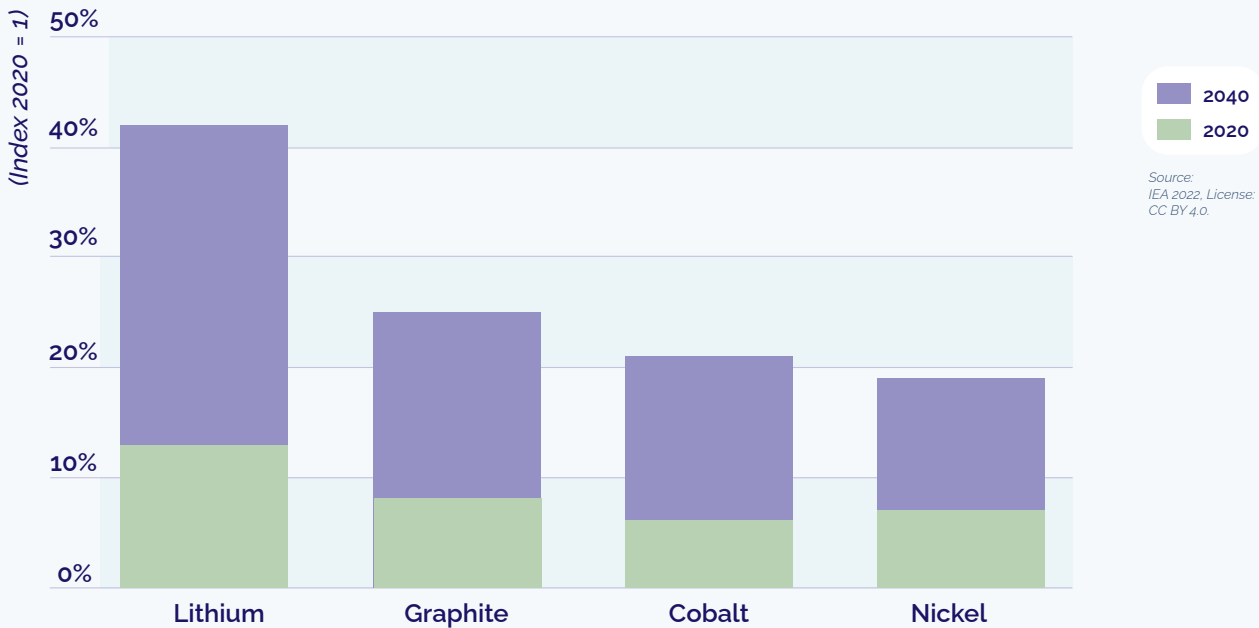
4 Leading battery producers in 2022: Asia, the dominant force



Source: SNE Research via Bloomberg, 2022.

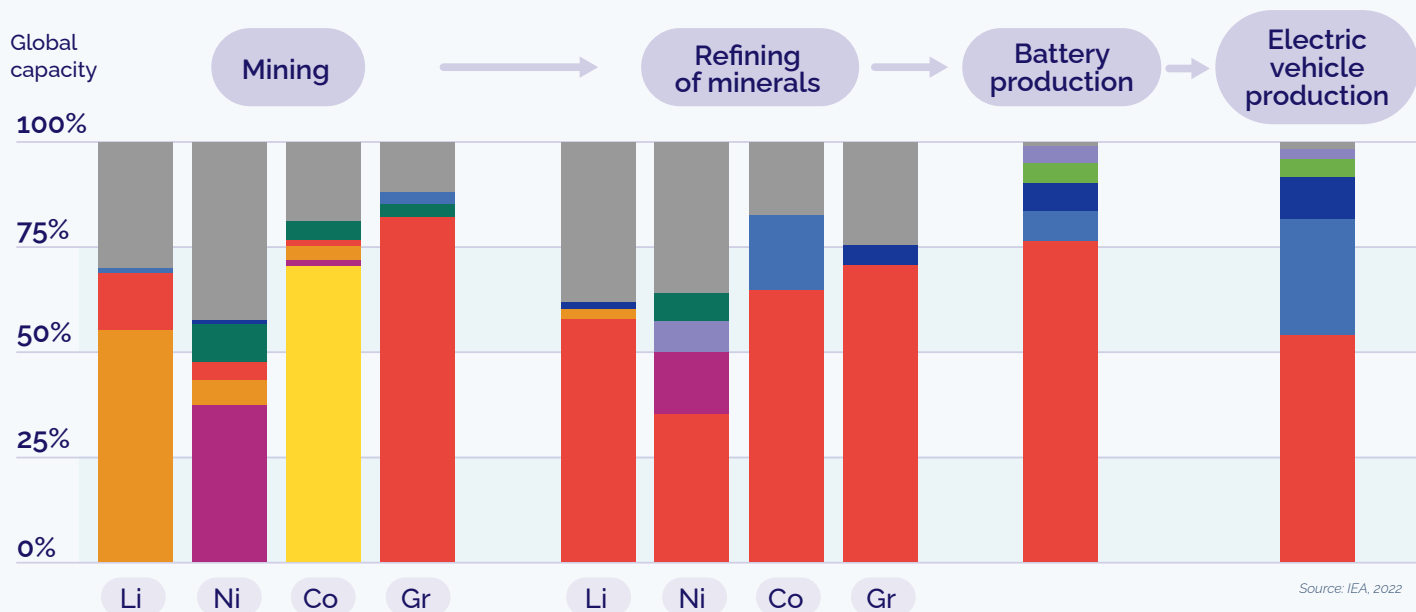


5 Global demand for the major components of electric vehicle batteries is skyrocketing



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Dependence on China can be found across the battery's entire value chain



Source: IEA, 2022

Geographic distribution by country.

- United States
- Europe
- Russia
- Japan
- Indonesia
- Other
- DRC
- China
- Korea
- Australia

7 Origin of the 4 main battery components

Main suppliers of raw and refined minerals to the EU, and countries that have the greatest mineral reserves, are the largest producers of raw minerals or have the largest refining capacity.

Cobalt supply by country

- Main EU suppliers:
- in raw minerals (%)
 - in refined minerals (%)
- Legend:
- Largest global reserves (%)
 - Leading producers of raw minerals (%)
 - Global refining capacity (%)



Source: EU Commission 2020; USGS

Lithium supply by country

- Main EU suppliers:
- in raw minerals (%)
 - in refined minerals (%)
- Legend:
- Largest global reserves (%)
 - Leading producers of raw minerals (%)
 - Global refining capacity (%)



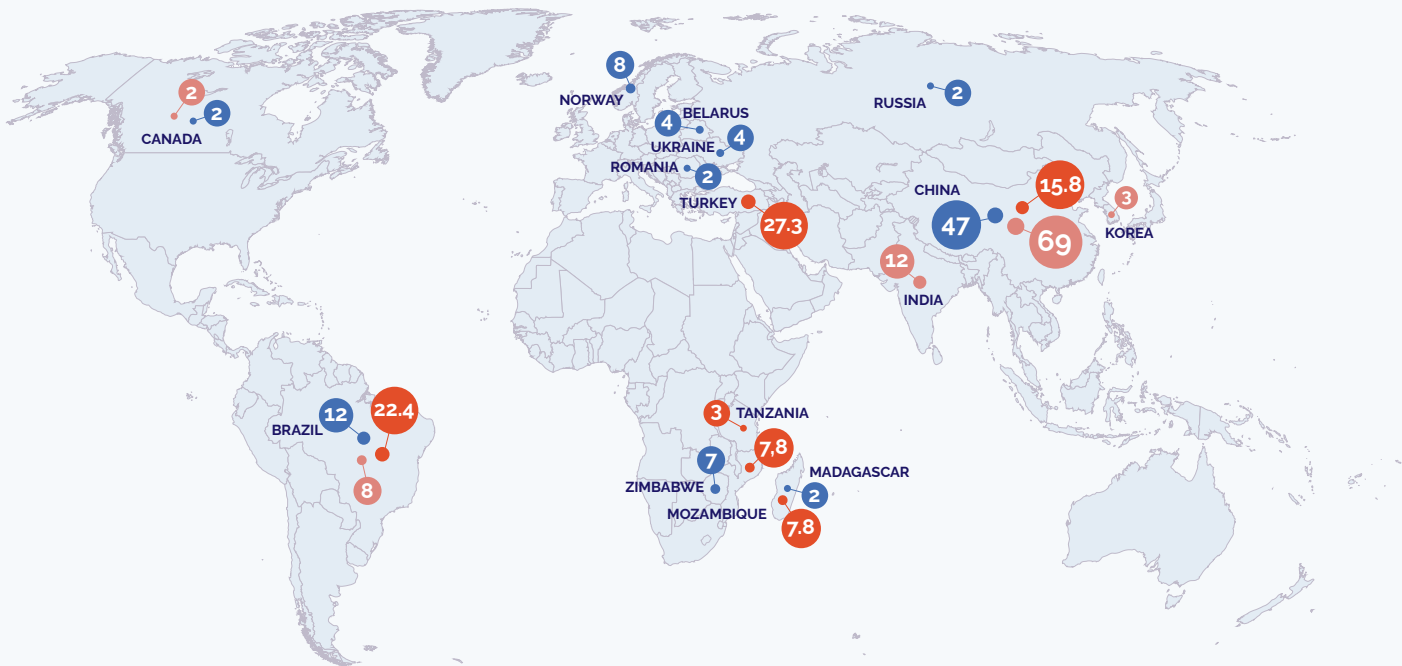
Source: EU Commission 2020; USGS

Natural graphite supply by country

Main EU suppliers:

- in raw minerals (%)
- in refined minerals (%)

- Largest global reserves (%)
- Leading producers of raw minerals (%)
- Global refining capacity (%)



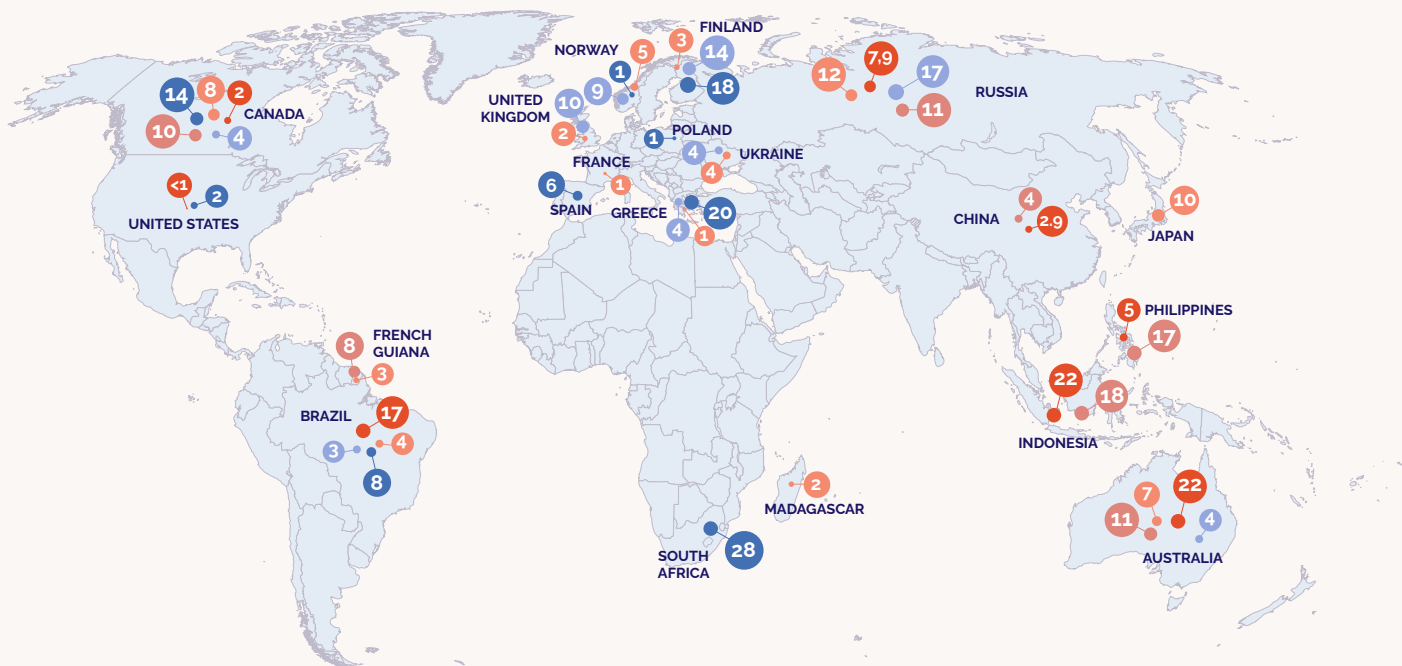
Source: EU Commission 2020; USGS

Nickel supply by country

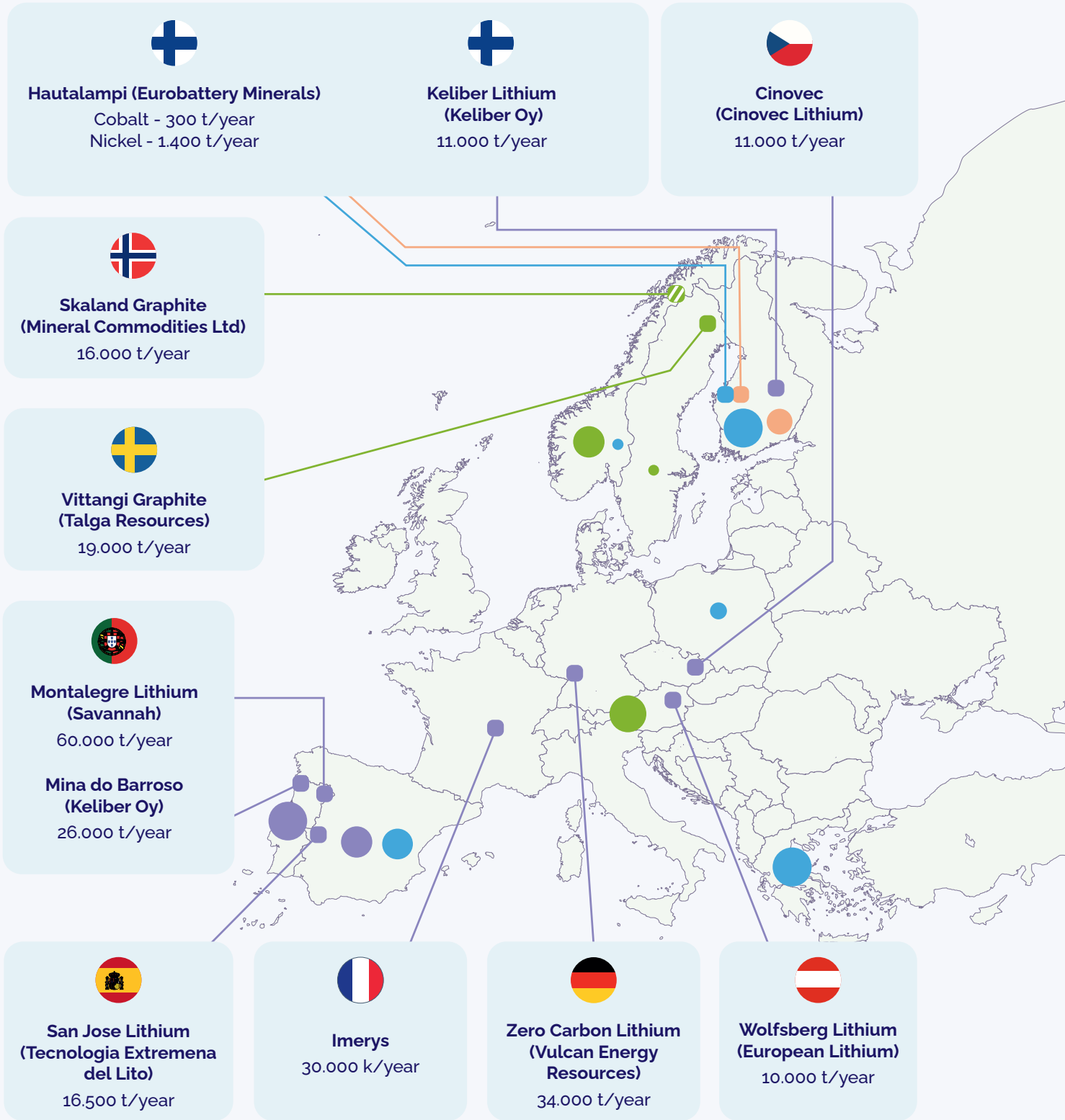
Main EU suppliers:

- in raw minerals (%)
- in refined minerals (%)

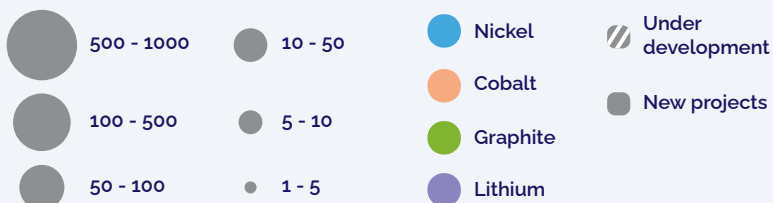
- Largest global reserves (%)
- Leading producers of raw minerals (%)
- Global refining capacity (%)



Source: EU Commission 2020; USGS



Production in hundreds of tonnes (2018, Minerals4EU)



Source: Ifri 2021, based on Minerals4EU data and company announcements.

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A European strategy to diversify the supply of minerals

Strategic mineral production and reserves for countries with which the EU has a trade agreement or an *ad hoc* agreement, pending ratification or under negotiation.



Sources: US geological Survey; USGS