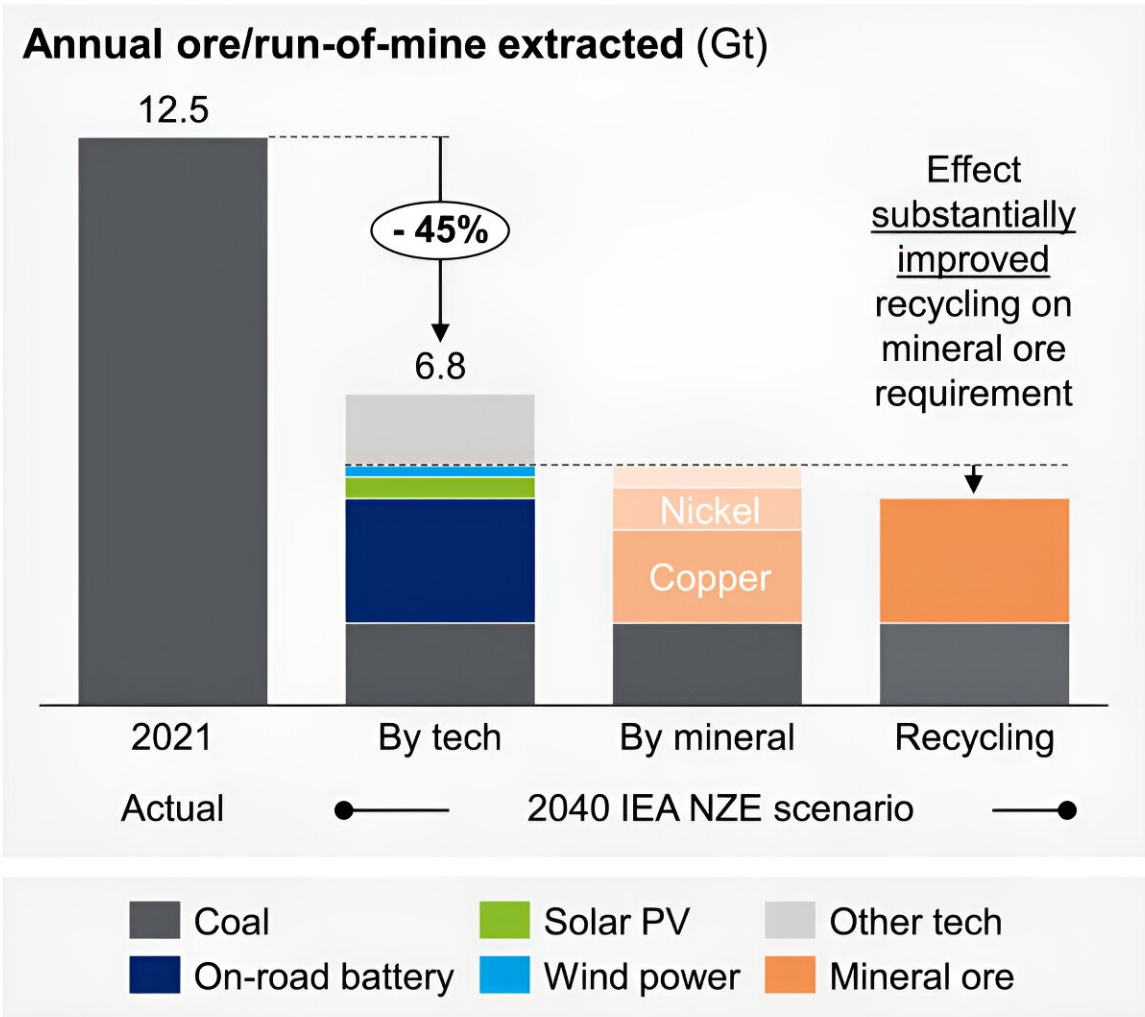


# Transition from fossil to clean energy will reduce global mining activities: Study

October 26 2023

**Overall energy system related mining activity will significantly decrease in a net-zero emissions pathway**



Graphical abstract. Credit: *Joule* (2023). DOI: 10.1016/j.joule.2023.10.005

A wide range of metals need to be mined for solar panels, wind turbines and batteries. Researchers from Leiden University have shown that this 'mining burden' does not outweigh the final gain: the overall mining activity is set to decrease as clean energy replaces fossil fuels such as oil, coal and gas.

"The scenario we looked at assumes that mining for minerals for the energy transition will increase by more than six times by 2040," says Joey Nijens (Deloitte), lead author of [the article in \*Joule\*](#), which he wrote together with researchers from Leiden University and Delft University of Technology.

"We compared this with coal mining today. Even when we assume a considerable increase in clean energy technology, global mining activities will decrease by almost half by 2040 because the [energy transition](#) will reduce the demand for coal."

## **Further reduction through recycling and changes in travel behavior**

According to co-author and Professor of Industrial Ecology René Kleijn (Leiden University), global mining could be further reduced if the materials used for [clean energy](#) technologies were recycled.

"Ideally, we would design a circular system from the beginning, so we can keep on using these valuable materials in the future and can further reduce global mining activity. Considerable gains stand to be made: according to our calculations, recycling would cause global mining

activity to drop to more than half."

Co-author Paul Behrens (Leiden University) believes changes in our energy needs and travel behavior would also reduce global mining. "If we make houses and businesses more energy efficient and use [public transport](#) and shared cars, the demand for fossil energy—and consequently for mining—will automatically decrease."

**More information:** Joey Nijens et al, Energy transition will require substantially less mining than the current fossil system, *Joule* (2023). [DOI: 10.1016/j.joule.2023.10.005](https://doi.org/10.1016/j.joule.2023.10.005)

Provided by Leiden University

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