

# Metal constraints for a low-carbon economy

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Credit: Leiden University

It is often thought that a transition to a low-carbon economy requires an enormous increase of the use of metals like steel and copper and smaller amounts of critical raw materials. For power generation and mobility systems, this is true. An electric car needs a battery. Wind turbines need strong magnets. Replacing a normal car for an electric car can easily require dozens or even hundreds of times more lithium per car, for

instance.

But the current amounts used in such applications are relatively low, Leiden researchers found. So researchers are studying the growth of use in such sectors compared to current dominant applications. Applying [life cycle assessment](#) and input output methods, tools pioneered by CML, scenarios were developed for the power and automotive sectors and the wider [economy](#) in general. Overall, the differences between the business as usual and low-carbon scenarios were much more moderate than expected. "In both types of scenarios, you see for most metals a demand that is three to four times higher in 2050 as now," says Arjan de Koning, who led the study. "In the low-carbon [scenario](#), we see only for neodymium and dysprosium five to eight times growth in demand. At the same time, for these metals, the current reserves are sufficient to cover their cumulative demand until 2050."

Does this imply there is no problem? "No, that is too simple," says Arnold Tukker, CML director. "Tripling or quadrupling resource supply is an enormous challenge. You do not open mines just like that. You need years of planning and large investments. These only will be done if mining companies and their banks are certain that the demand will be there. Some [materials](#) come from conflict areas, like the Congo. Some mines are concentrated in just a few countries, which can act as monopolists. It is hence very appropriate that the EU tries to tackle such challenges via its Raw Materials Initiative, the EIT Raw Materials, and the Circular Economy Package. It is just that such problems must be solved anyway, whether one implements low-carbon technologies or not. So, let us not use the lack of materials as an excuse to postpone the transition to a carbon neutral economy."

**More information:** Arjan de Koning et al. Metal supply constraints for a low-carbon economy?, *Resources, Conservation and Recycling* (2017). [DOI: 10.1016/j.resconrec.2017.10.040](https://doi.org/10.1016/j.resconrec.2017.10.040)

Provided by Leiden University

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