

Transition to electric vehicles puts heavy pressure on production of critical metals

November 11 2019, by Bryce Benda

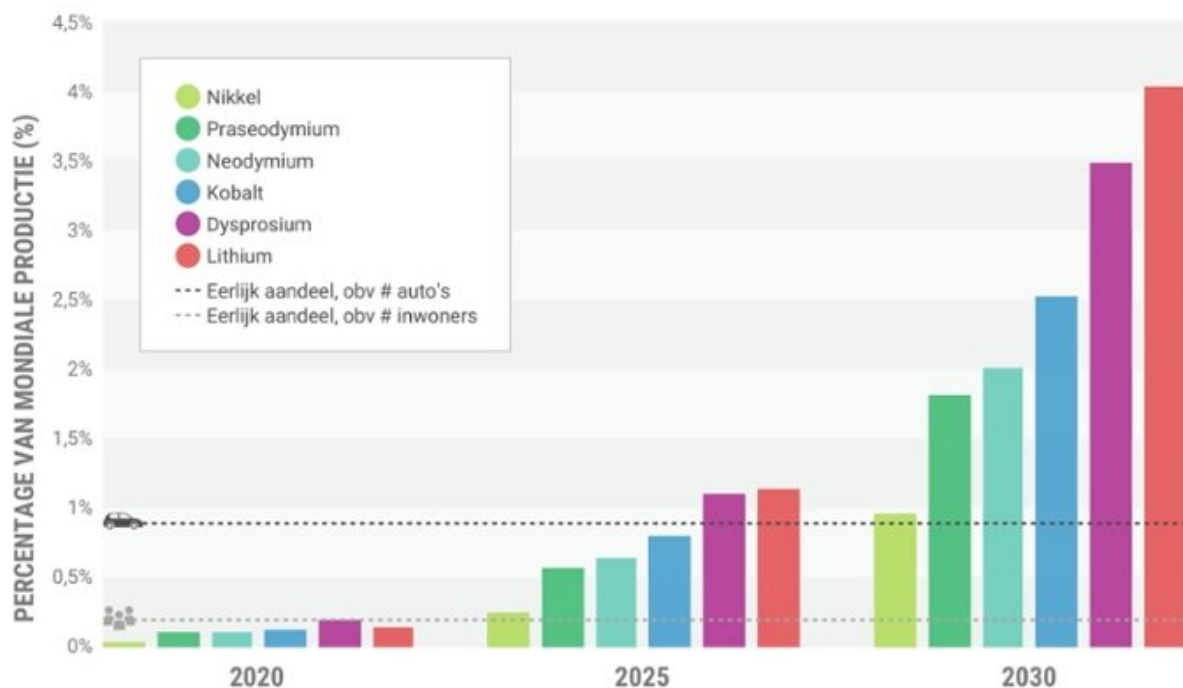


Figure 1. Critical metals needed for electric vehicles in the Netherlands, as a percentage of the worldwide annual production of these critical metals in 2020, 2025 and 2030. Credit: Leiden University

The current production of a number of critical metals is insufficient for the large-scale transition to electric vehicles. This is the conclusion of a report by environmental scientists Benjamin Sprecher and organisations

Copper8 and Metabolic. As a solution, they advocate more electric car-sharing, cars with a smaller battery and improved recycling.

Small country, big impact

The Dutch Climate Policy aims for 1.9 million electric cars in the Netherlands by 2030, compared to 171.000 at this moment—a growth of more than 1000 percent in less than 11 years. But according to the report "Critical Metals Demand for Electric Vehicles" – which looks at critical metals needed for this growth—it would be better to limit this growth, so that there will be a maximum of 1 million electric cars in 2030. The authors assume a fair distribution: each country is entitled to a certain share of the global production of important critical metals, such as lithium and cobalt, in proportion to its population. With the current plans for electric cars, the Netherlands would need up to 4 percent of the global annual production, while the Netherlands only has 0.2 percent of the world's population—an 'unfair distribution,' according to the report.

Less is more

"Let me start by saying that we are definitely not against the introduction of electric cars," says Benjamin Sprecher, researcher at the Centre for Environmental Sciences Leiden. The transition to electric transport is important," says Benjamin Sprecher, a researcher at the Institute of Environmental Sciences. "However, we must be aware that this policy is not without consequences." He explains, for example, that a greater demand for critical metals—which are also needed for solar panels and wind turbines—can be disastrous to nature. "Increased demand inevitably leads to the construction of new mines. In order to prevent inconvenience to humans, these will be located in remote areas, at the expense of already scarce nature reserves. We must be aware of this and ensure more sustainable mining."

But that's not enough, says Sprecher. "We consume an awful lot, so much so that it is no longer enough for us to have just one Earth. In the case of [electric cars](#) too, it is important that we look at ways to reduce the number of cars. For example, shared cars and improved public transport." Other solutions, such as new technologies that are less dependent on critical metals or the use of smaller batteries, are less effective (see figure 2) but also easier to implement. Finally, the report recommends the development of a stronger European critical metals recycling industry.

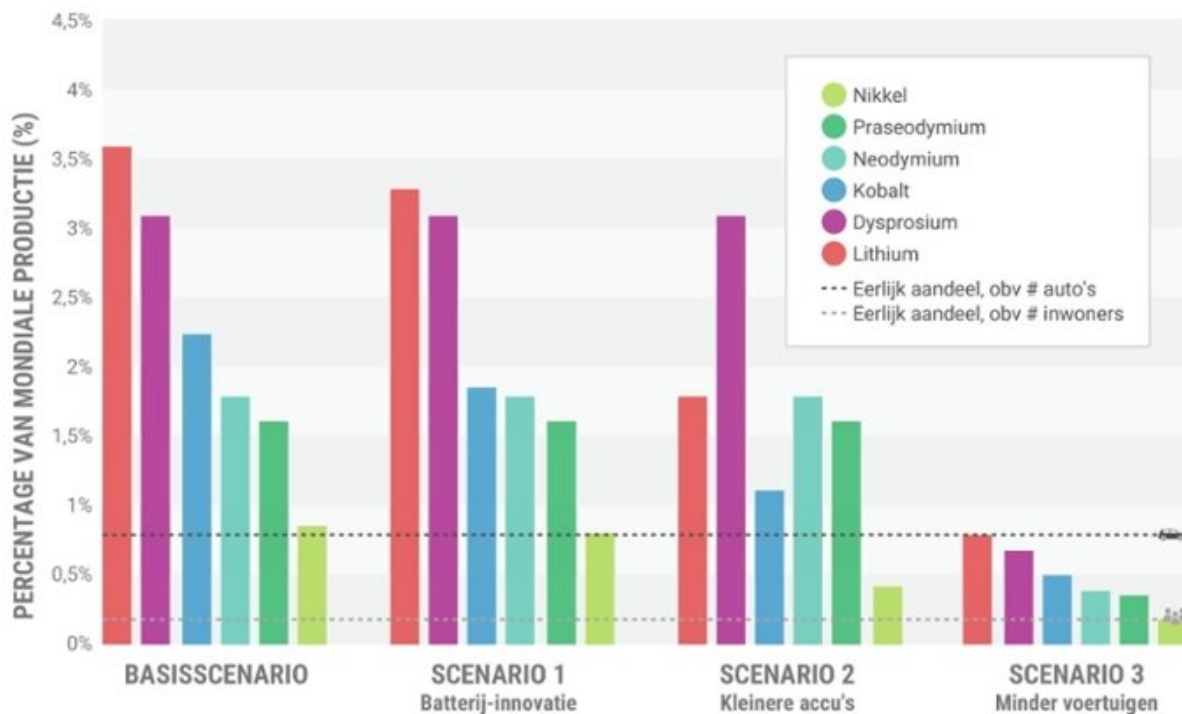


Figure 2. Three scenarios for reducing metal demand from electric transport. Scenario 1 looks at new battery technologies: socially simple, but technically unrealistic in the short term. Scenario 2 examines smaller batteries: this results in less range, but also in less metals. However, the effectiveness of this approach appears to be limited. Scenario 3 is by far the most effective, but also socially the most complex: by making more effective use of electric vehicles, fewer

vehicles are needed and therefore also fewer metals. Credit: Leiden University

Impact as a scientist

The report is the second collaboration of Sprecher with Copper8 and Metabolic, two consultancy companies that focus on sustainability. Commissioned by the Ministry of Infrastructure and Water Management, they already worked last year on the report "[Metal Demands of the Dutch Energy Transition](#)," which even made it to the *Wall Street Journal*. "We wrote this second report on our own initiative, in our spare time. It's a really special collaboration. There is a great need for this kind of input from science. In addition, as a scientist it is a good opportunity to give existing knowledge a voice and to carry out new research with less traditional partners."

The authors of the report also hope for better policy, by creating understanding among the public and policymakers. The latter has already been quite successful: "At the Springtij Forum on the Dutch island Terschelling, we presented our report to the State Secretary for Infrastructure and Water Management, Stientje van Veldhoven. She is going to present it in a month's time at the global climate gathering Conference of Parties. Very nice to see how much impact such a report can have."

More information: Metal demand in the Dutch energy transition: [www.copper8.com/en/metaalvraag ... se-energietransitie/](http://www.copper8.com/en/metaalvraag...se-energietransitie/)

Provided by Leiden University

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