

Technological change and its influence on critical metals in passenger vehicle components

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Context

Technological development relies on increasing use of rare and specialty metals with uncertain future supply from geological resources. Passenger vehicles are one of the main end uses of these metals, and could be an important source of secondary (recycled) metals in the future. By examining past development of automotive technologies, devices and their content of critical metals we can facilitate better forecasts of future metal flows in end-of-life vehicles and improve our understanding of future resource needs of the automotive industry.

Goals

This Master's thesis project should explore these issues through a study of 2-5 specific automotive devices or components that have gained widespread use or experienced significant technological change in the past 10-20 years. The selection of technologies should be based on data availability, relevance for critical metals in cars, and a lack of similar studies in the scientific literature. The study should address the following research questions:

1. How has the critical metals content of the selected devices or components developed over time?
2. What are the reasons for changes in critical metals content in selected devices or components?
3. How is critical metals content of the selected devices or components expected to develop in the future?

The work should explore and reflect on different methods and sources of information for studying technological developments over time in a critical metals context. Possible methods and information sources include, but are not limited to, analysis of patents, product data from manufacturers, various databases for passenger vehicles, as well as direct sampling and analysis of parts from car dismantlers.

Additional information

The Master's thesis will be linked to an EU project on the stocks and flows of critical raw materials in electrical and electronic equipment, passenger vehicles, batteries and their respective waste streams.