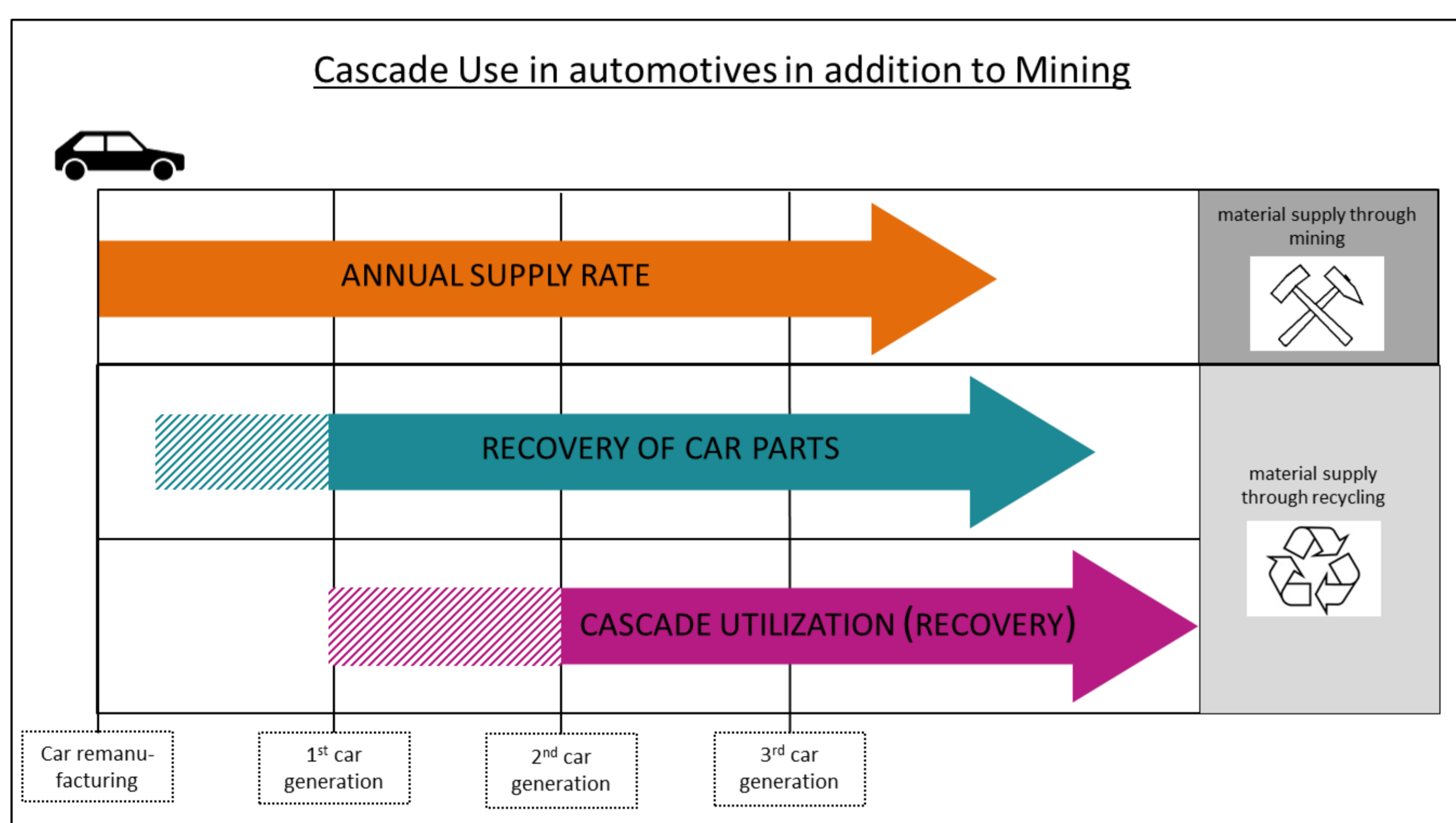


Research Group: CASCADE USE

Cascade Use supports the ambition of societal actors towards a reduced resource use and minimizing CO2 emissions in the long-term. The members of the research group will develop and test a key assessment tool. The interdisciplinary work concentrates on the two core questions of how materials are integrated into life cycles and when they will become available for reuse and/or recycling.



Ambition

Thereby, the target is to keep resources within the economic cycle as long as possible in order to reduce or even avoid the use of primary raw materials. For this purpose, the car will serve as showcase application, respectively the reuse/recycling of car components with a focus on the market situation in China and Germany. By calculating the reduction of CO2 emissions the user can decide for himself how much he/she wants to contribute to resource efficiency.

Research Topics

In Cascade Use we concentrate on material related topics in car manufacturing and recycling and their potential to reduce CO2 emissions, as

- Scrap tire recycling
- Critical metals and material flow assessment
- Life Cycle Assessment
- Design for Resource Efficiency
- Electro mobility (Lithium Ion Batteries, fuel cells)

Example: Markets for Resources

Knowledge about markets is essential for economically reasonable reuse of products. Remanufacturing, for example, suffers from supply and procurement issues. The loss of products as supply for remanufacturing to less sustainable recycling solutions is most probably favoured by potential profits they generate on different markets.



Example: Scrap tire Recycling

The recycling of tires is not a new technology, but there are many important issues to look at, especially from the viewpoint of protection of the environment. Due to the need of tires on every car, there is still a constant need on scrap tire recycling. Recovering the rubber and other materials from scrap tires is the biggest market in scrap tire recycling. There are many new applications for the recycled rubber.



Dr.-Ing. Alexandra Pehlken

Group Leader

Main Research Topics:

- Scrap Tires
- Resources for Electro Mobility

Research Scientists:

Matthias Kalverkamp, M.Sc.

Main Research Topics:

- Markets and Supply Chains

Clayton Burger, M.Sc.

Main Research Topics:

- IT and Uncertainty of Models

Literature

- Pehlken, A., Kaerger, W., Ming Chen, Müller, D.H.; The necessity of recycling networks for the sustainable usage of automotive parts – case study Germany and PR China, in: Environmental Issues in Automotive Industry - design, production and end-of-life phase, Springer, 2014, http://link.springer.com/chapter/10.1007/978-3-642-23837-6_9
- Pehlken, A., Decker, A., Rolbiecki, M., Thoben, K.D., Assessing the future potential of waste flows – case study scrap tires; International Journal of Sustainable Development and Planning, Vol 9 Issue 1, pp. 90-105, WIT Press, 2014, <http://journals.witpress.com/journals.asp?iID=100#papers>