



Contribution of material cascade utilization to sustainable resource management

Research Group at Oldenburg University (2014-2018)

Presentation at the
Kick-off Meeting IPID4ALL
April 21st 2015, Oldenburg

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Aim of the Research Group

The research group 'Cascade Use' supports the ambition of societal actors towards a reduced resource use and minimizing CO2 emissions through energy efficiency in the long-term. 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. 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.



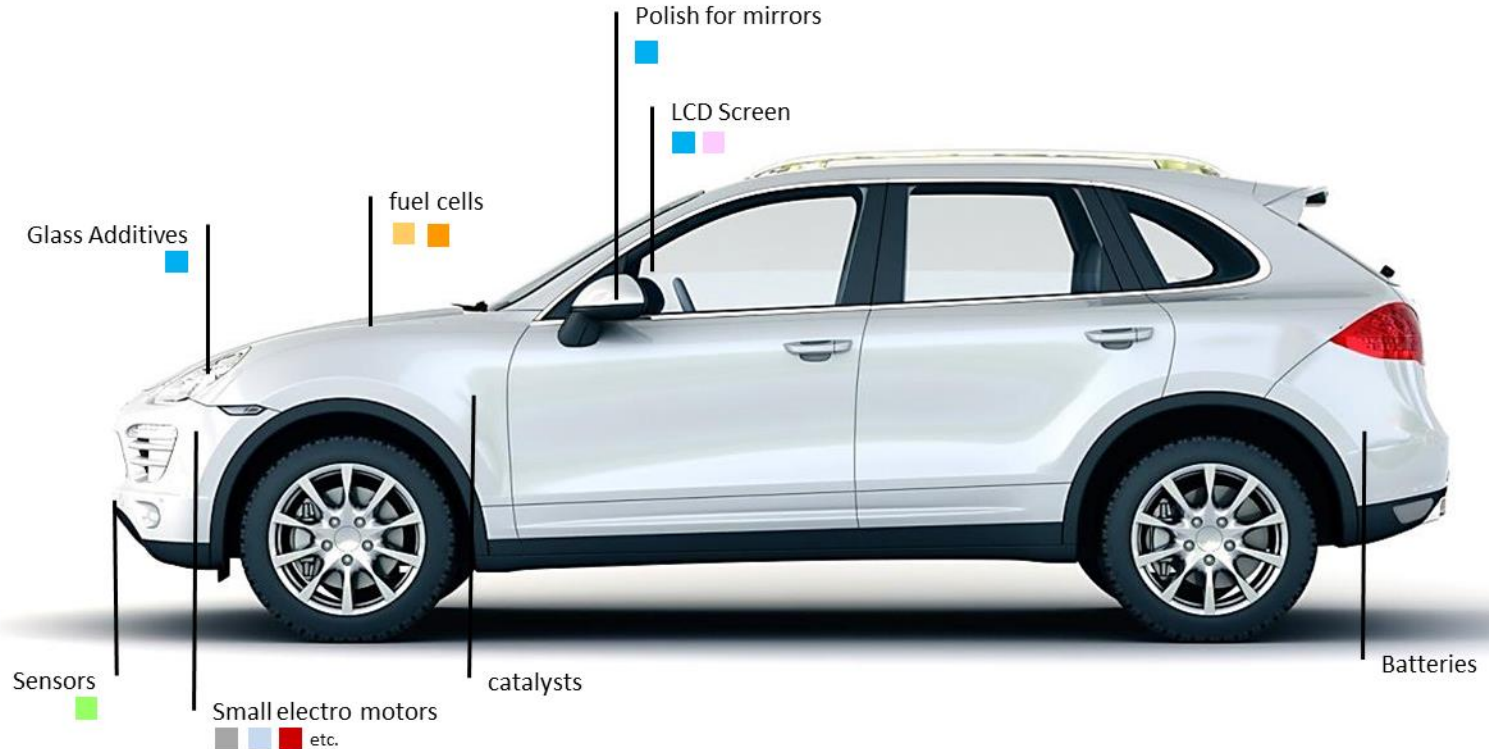
Cascade Use – Like this?



Quelle: www.heise.de

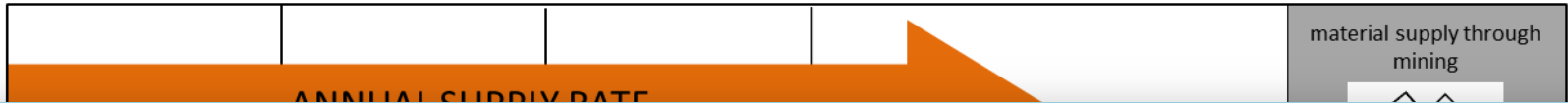
Modern Car: Rare earth en masse

- Cer
- Cobalt
- Dysprosium
- Europium
- Lanthan
- Lithium
- Neodym
- Palladium
- Platin
- Ruthenium
- Terbium
- Yttrium

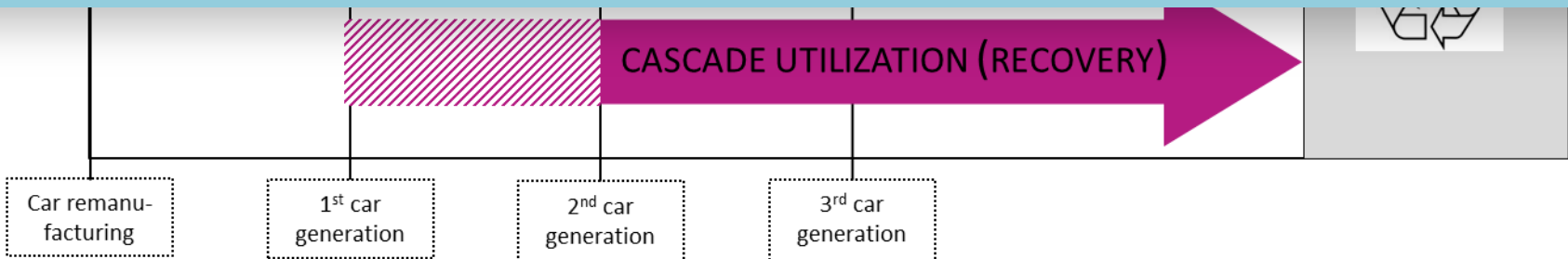


Quelle: FTD / Hintergrundbild: © Supertrooper - Fotolia.com

Cascade Use in addition to Mining



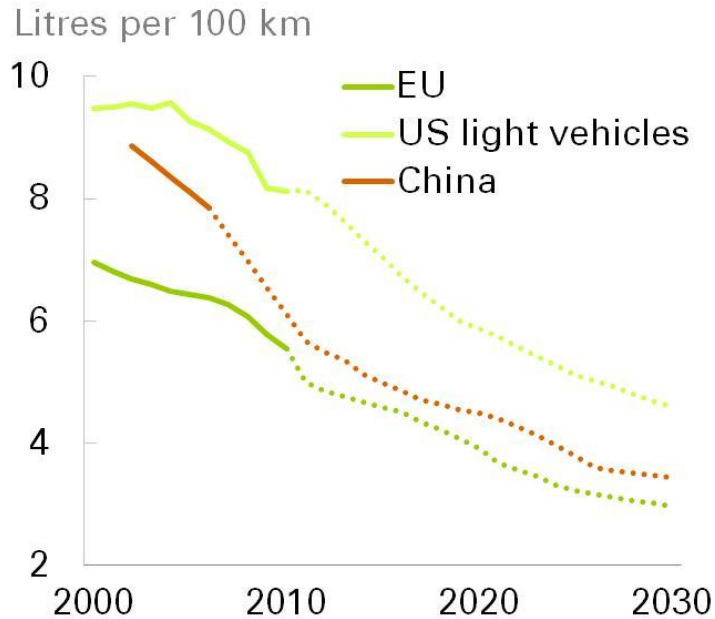
How much energy can we save through the life cycles?



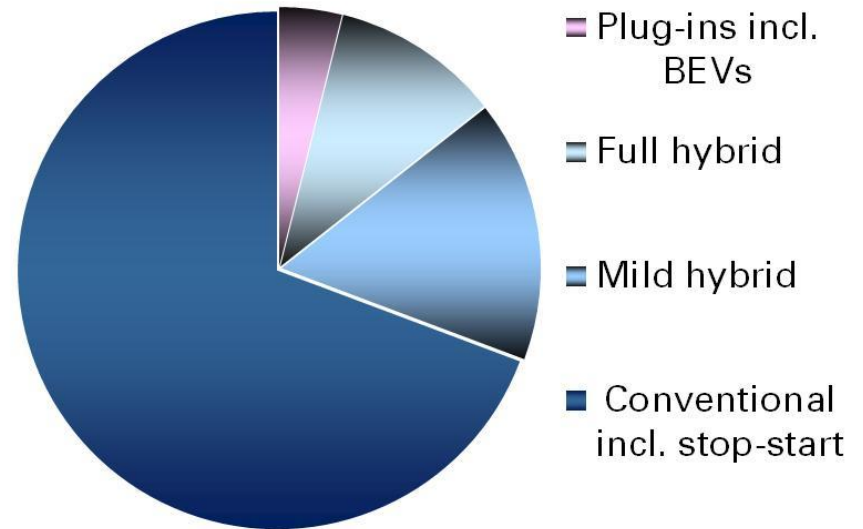


Policy and technology enable efficiency improvements

Projected car efficiency



Global vehicle fleet in 2030



Collaboration with China (1)

- Collaboration with Shanghai Jiao Tong University, Prof. Chen Ming (Remanufacturing; Mechanical Engineering)

- Joint Research and Publications

Environmental Issues in Automotive Industry
EcoProduction 2014, pp 209-222

Date: 04 Sep 2013

The Necessity of Recycling Networks for the Sustainable Usage of Automotive Parts: Case Study Germany and PR China

Alexandra Pehlken, Wolfgang Kaerger, Ming Chen, Dieter H. Mueller



- Visiting PhD students from China (Jin Tian)

Summer School

Application

HOW TO APPLY?

Send your application before April 13 2015 and follow the link for the application form:

<http://www.phd-renewable-energy.de/en/events/>

Participants are requested to present their research with a poster (A1).

A 100 EUR fee is applicable and is to be paid in cash at the venue.

WHO SHOULD APPLY?

The summer school is aimed at young scientists who are doing research in any aspect of electro mobility (mainly at doctorate level, but also young post-docs and advanced master students). Funding opportunities are available for international doctoral students.

Summer School

HOW EFFICIENT IS ELECTRO MOBILITY?

Hanse-WissenschaftsKolleg (HWK) &
University of Oldenburg

June 1-5, 2015
Lehmkuhlenbusch 4
27753 Delmenhorst (Germany)

- Extensive industry exposure
- Lectures on state-of-the-art topics in electro mobility.
- Field trips
- Participation in experts workshop

The main scientific topics are:

- Energy and material efficiency
- Integration of IT systems
- Smart mobility
- Business models and challenges
- End-of-life management

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Summer School Electro Mobility:

How Efficient is Electro Mobility?

June 1 – 5, 2015, Delmenhorst (Germany)

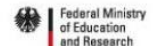
SIGN UP NOW!!!



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Summer School and Expert Workshop on Electro Mobility: 'How efficient is Electro Mobility'

Monday, June 1, 2015 - Summer School

- 10:00 Arrival and Welcome Coffee**
- 10:30 Opening and introduction to the conference (the organizers)
- 11:15 Schaufenster Electro Mobility (N.N., Oldenburg University)
- 12:00 Integration of Electric Cars with Smart Buildings (Wedigo von Wedel, NEXT ENERGY, Oldenburg)
- 12:45 Lunch**
- 14:00 World Café
- 15:30 Coffee Break and Poster Session**
- 16:00 Sustainable Mobility (N.N., Oldenburg University)
- 16:45 Electro Mobility in Future Smart Grids (Sebastian Lehnhoff, Offis e.V.)
- 17:30 *Discussion and wrap-up of Day 1*
- 18:00 Dinner at HWK**

Tuesday, June 2, 2015 - Summer School

- 09:00 Critical Metals in the Automotive Industry (Alexandra Pehlken, Oldenburg)
- 09:45 Potential of Electronics and their Material Value in Cars (Kerstin Kuchta, Hamburg)
- 10:30 Coffee Break**
- 11:00 Sustainable Engineering (Tina Dettmer, Braunschweig) tbc
- 11:45 Automatisierung in Car Recycling (Nirugaa Natkunarajah, Siegen)
- 12:30 *Discussion*
- 12:15 Lunch Break**
- 13:45 *Poster Session*
- 15:00 Coffee Break**
- 15:30 Automotive Batteries - Basics to Know (Michael Wark, Oldenburg)
- 16:15 Material Flows in Batteries (Paul Mähltz, Berlin)
- 17:00 *Discussion and wrap-up of Day 2*
- 17:30 Dinner at HWK**

Wednesday, June 3, 2015 - Excursion

- Morning *Plant Visit: Mercedes-Benz in Bremen*
- Afternoon *Industrial Visit - Recycling (Veniox)*

Thursday, June 4, 2015 - Experts Workshop

- 10:30 Arrivals and Welcome Coffee**
- 11:00 Opening and Introduction
- Session: Materials Perspective**
- 11:20 Cascade Use & the Correlation to Efficiency (Alexandra Pehlken, Oldenburg University)
- 11:50 Criticality of resources related to mobility (Steven Young, Waterloo, Canada)
- 12:20 How does Recycling Close the Loop? (N.N.)
- 12:50 Lunch**
- Session: Mobility**
- 14:00 Sustainable Mobility within Schaufenster Electro Mobility (Benjamin Wagner vom Berg, Oldenburg University)
- 14:30 The South African Way (NN, South Africa) tbc
- 15:00 Battery Driven Container Carriers (Serge Runge, Offis e.V.) tbc
- 15:30 Coffee Break**
- 16:00 Dismantling System of Lithium Ion Batteries (Nirugaa Natkunarajah, Siegen)
- 16:30 Batteries – The Next Generation (Julian Schwenzel, Fraunhofer IFAM, Bremen)
- 17:00 State of the Art in Battery Research (Michael Wark, Oldenburg University)
- Evening Dinner**

Friday, June 5, 2015 - Experts Workshop

- Session: Fuel Cells and System Integration**
- 09:00 Fuel Cells in Automotive Applications (Pang-Chieh Sui, University of Victoria, Canada)
- 09:30 Challenges in System integration. (N.N)
- 10:00 Integration of Large Fleets of PHEVs into Smart Grids (Curran Crawford, University of Victoria, Canada)
- 10:30 Coffee Break**
- 11:10 LCA results of electrification of ICE cars (Eckard Helmers, University of Applied Sciences Trier, Birkenfeld)
- 11:40 **Key Note Lecture (NN)**
- 12:30 Lunch Break**
- Session: (Re-)Manufacturing**
- 13:30 Processing and Automation (Christoph Hermann, Tina Dettmer, Braunschweig) tbc
- 14:00 Sustainable Manufacturing / Design for Environment (Bernard Hon, University of Liverpool, UK)
- 14:30 Remanufacturing in China (Chen Ming, SJTU, China)
- 15:00 Coffee Break**
- 15:30 Potential Market and Strategies for Material Recovery and Part remanufacturing of New Energy Vehicles in China (Jinsheng Xiao, China)
- 16:00 Activities in the Metropolitan Region (Matthias Brucke, Clustermanager Automotive Nordwest e.V. Bremen)
- 16:30 Departures**



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