Decision Making in Car Dismantling and Recycling

Cascade Use
Research Group at Oldenburg University

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Please see also ICM media

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For all press releases related to IARC 2018

What we do

- ✓ ‘Cascade Use’ supports the ambition of societal actors towards a reduced resource use and minimizing CO_2 emissions in the long-term.
- ✓ We develop and test a key assessment tool for decision making on the environmental performance on car parts reuse or recycling.
- ✓ The target is to keep resources within the economic cycle as long as possible in order to reduce or even avoid the use and processing of primary raw materials.

What do we want?

SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

- ✓ By 2030, achieve the sustainable management and efficient use of natural resources
- ✓ By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse
- ✓ By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

Our Case study: The car and its life cycle(s)

Processing of Raw Materials (e.g. car manufacturing)

Export Worldwide

Trade-in as Second-hand Car

Dismantling

Secondary Raw Materials through Recycling Processes

Raw Material Processing

Remanufacturing of Selected Car Parts

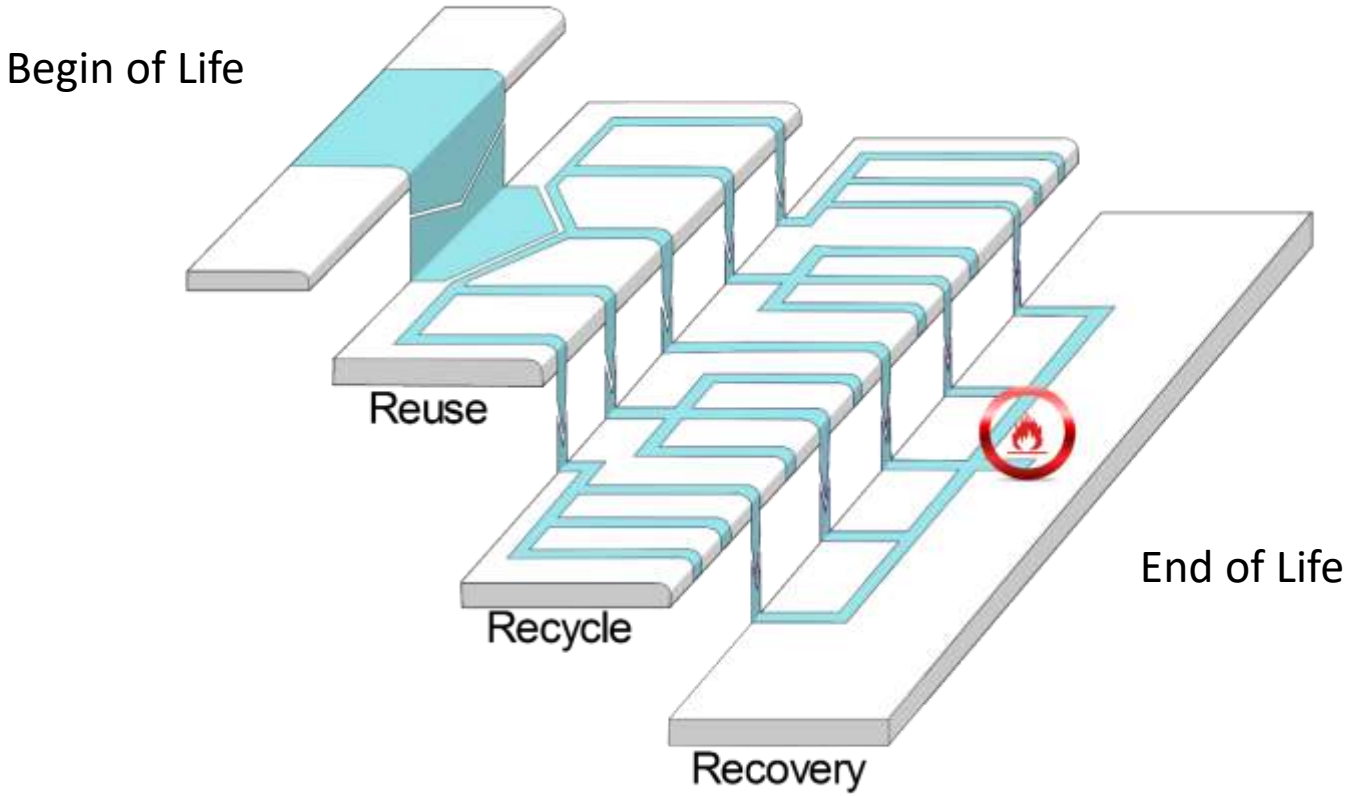
Sale of Used Car Parts

Sale as Second-hand Car

Use of Remanufactured Car Parts

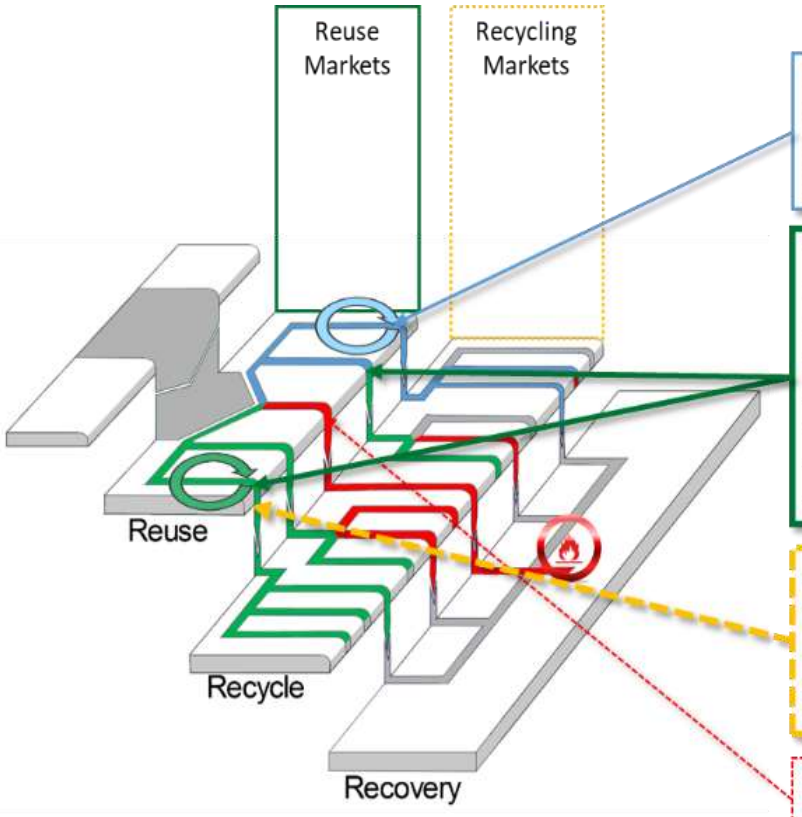
Green Car seen in Oldenburg , Germany

The Cascade



Kalverkamp, Matthias; Pehlken, Alexandra; Wuest, Thorsten (2017): Cascade Use and the Management of Product Lifecycles. In: Sustainability 9 (9), S. 1540. DOI: 10.3390/su9091540

The Cascade in automotive aftermarket



CLSC Example: OEM-controlled product flows through closed-loop supply chains; loops end after a number of reuse cycles and leakage occurs; or products are actively steered into recycling and recovery.

'Cambio Volante' Case: Used-car converters utilize export supply chains from Japan to establish new additional lifecycles from both formerly closed-loop supply chains (see example above) or from classic forward supply chains.

Challenges for corresponding supply chains:

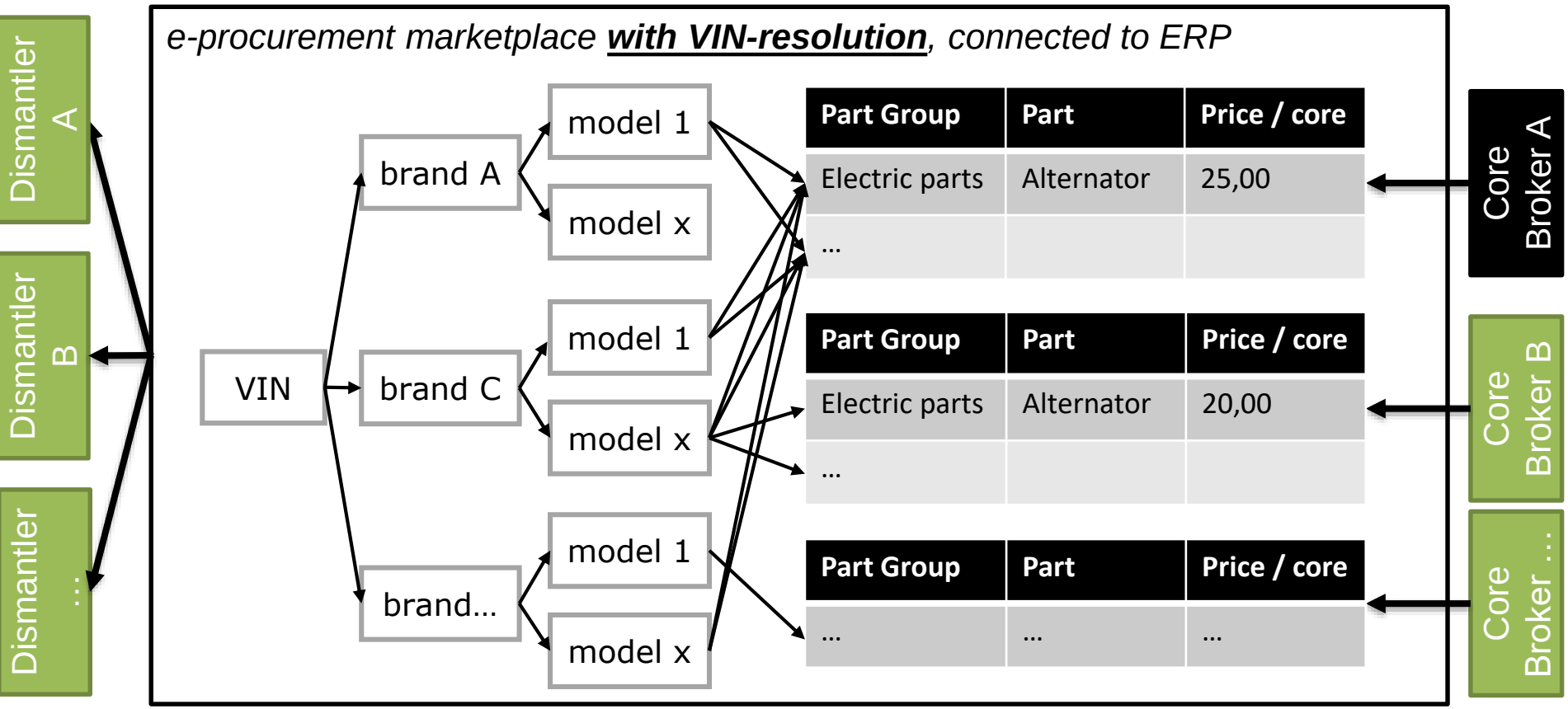
- *Unavailable or extremely expensive spare parts*
- *Limited access to used parts from LHD countries*

Recycling issues:

- *Recycling landscape is very limited in the region (Chile, Bolivia, Paraguay)*
- *Extended use of vehicles counterproductive for the environment at some point*

Direct-recycling issue: In this particular case, if directly recycling, environmentally preferable reuse precluded.

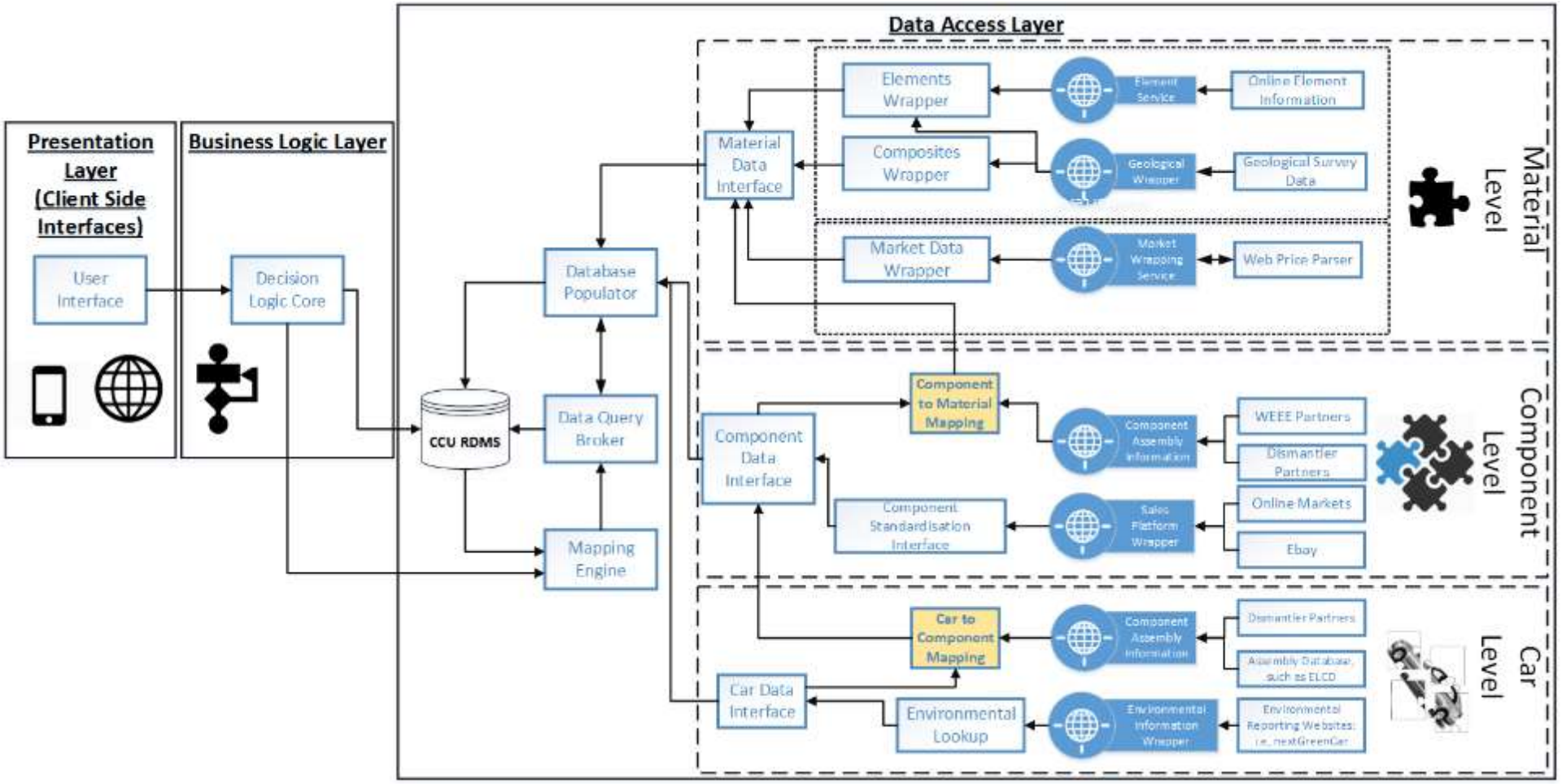
Increasing Reuse Opportunities : Potential Development for Trade with Reused Parts



Kalverkamp, Matthias (2017): Supplier Relationship Management in a Circular Economy. Core Brokers in Automotive remanufacturing. In: K. S. Pawar, A. Potter und A. Lisec (Hrsg.): Proceedings of the 22nd International Symposium on Logistics (ISL 2017). Data Driven Supply Chains. Ljubljana, Slovenia, 9-12th July 2017. Nottingham: Nottingham University Business School, p. 654–662. Online available http://www.isl21.org/wp-content/uploads/2017/07/ISL_2017_Full_Papers.pdf

Our Decision Tool „RAUPE“

Raupe: **R**ecycling of **A**utomotive **U**nits and **P**arts **E**valuator
Based on user generated content



Lichtmaschine

Elektrik > Anlasser, Lichtmaschine

Lichtmaschine (gebraucht)

Produktinformation

- **Ersatzteil**
  Lichtmaschine 1,0;Polo (6N /6KV ab 95); Classic /030903023E
- **Laufleistung**
  5km
- **Originalteilnummer**
  028903025H
- **Baujahr**
  1995
- **Preis**
  gebraucht: 58,25 EUR
  +7,00 EUR Versand inkl. MwSt.
  neu: 91,59 EUR
  +10,00 EUR Versand inkl. MwSt.

Mach mit!
Jetzt als Partner die Seite bearbeiten und Informationen teilen.

Fragen zu diesem Bauteil?
Partner anschreiben und in den Direktkontakt treten

gebraucht 58,25 EUR
64 % Preisersparnis

neu 91,59 EUR

Einsparpotenzial für das ausgewählte Bauteil

Einsparpotenzial gesamt

+18% CO²-Ersparnis

+87% Material - Ersparnis in kg

In den Warenkorb
Auf die Wunschliste

Bestandteile & Materialien | Periodensystem

Part	Material	Weight (kg)	Replacement probability (%)
Strator	Steel	0.773	20
Rotor coil	Copper	0.550	22
Rotor	Iron cast	1.094	19
Drive shaft	Steel	0.262	10
Belt fitting	Steel	0.519	10
Fan	Steel	0.138	10
Spacer	Aluminium	0.003	50
Bearings	Rolled steel	0.099	50
Slip ring N	Copper	0.033	100
Slip ring S	Copper	0.071	100
Housing	Iron cast	2.527	15

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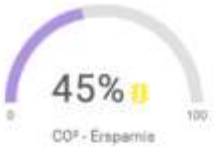

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Bestandteile & Materialien | Periodensystem

Folgende Elemente sind in diesem Bauteil enthalten

Based on the history of sold car parts

Drive	Lighting	Brake	Electrical
			
56.478 Products	29.834 Products	15.053 Products	58.910 Products

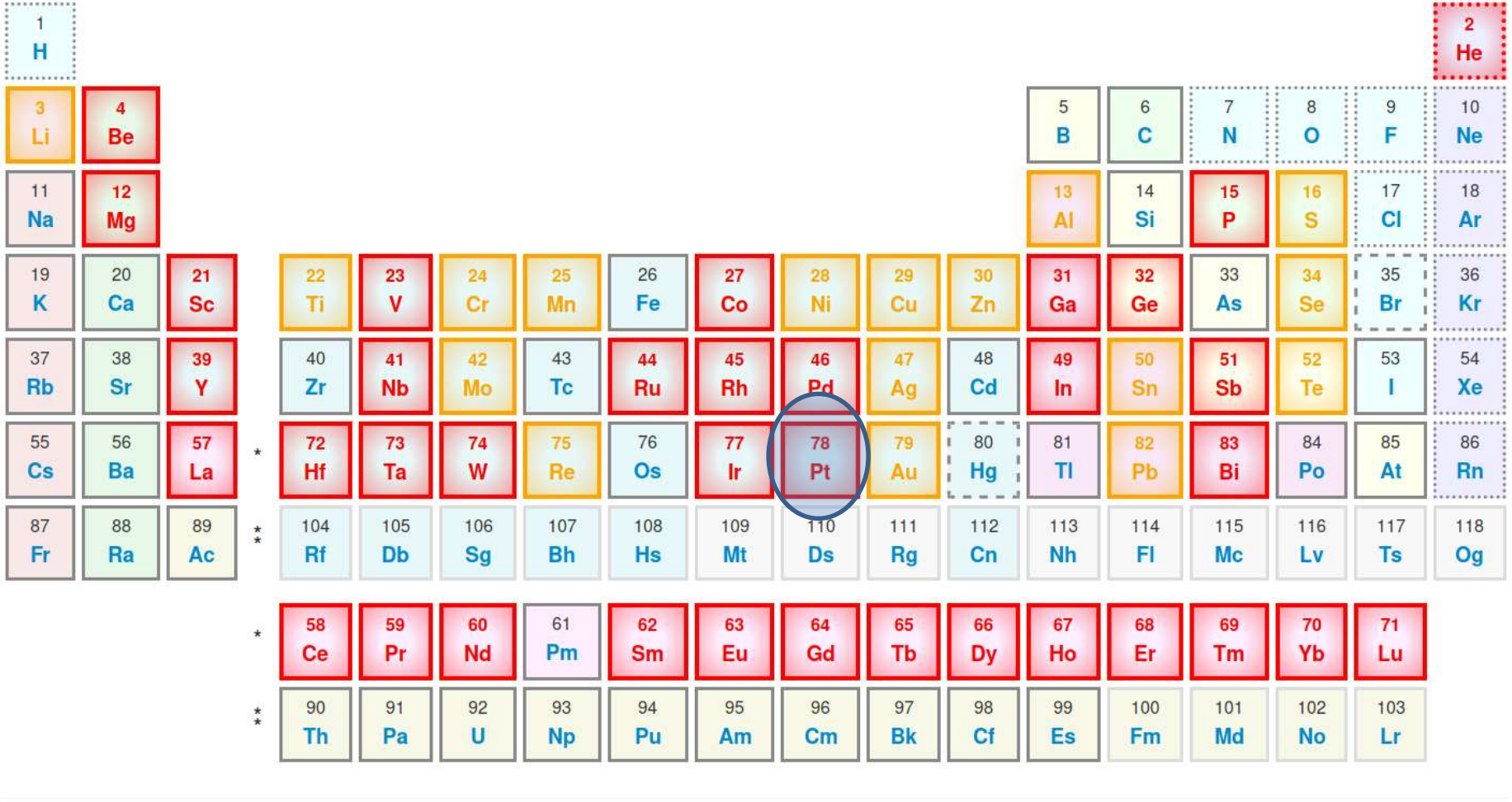
Undercarriage	Windows and panes	Interior	Body parts
			
25.312 Products	2.814 Products	25.552 Products	64.605 Products

Comfort equipment	Complete Packages	Steering	Other
			
15.926 Products	18 Products	1.655 Products	14.906 Products

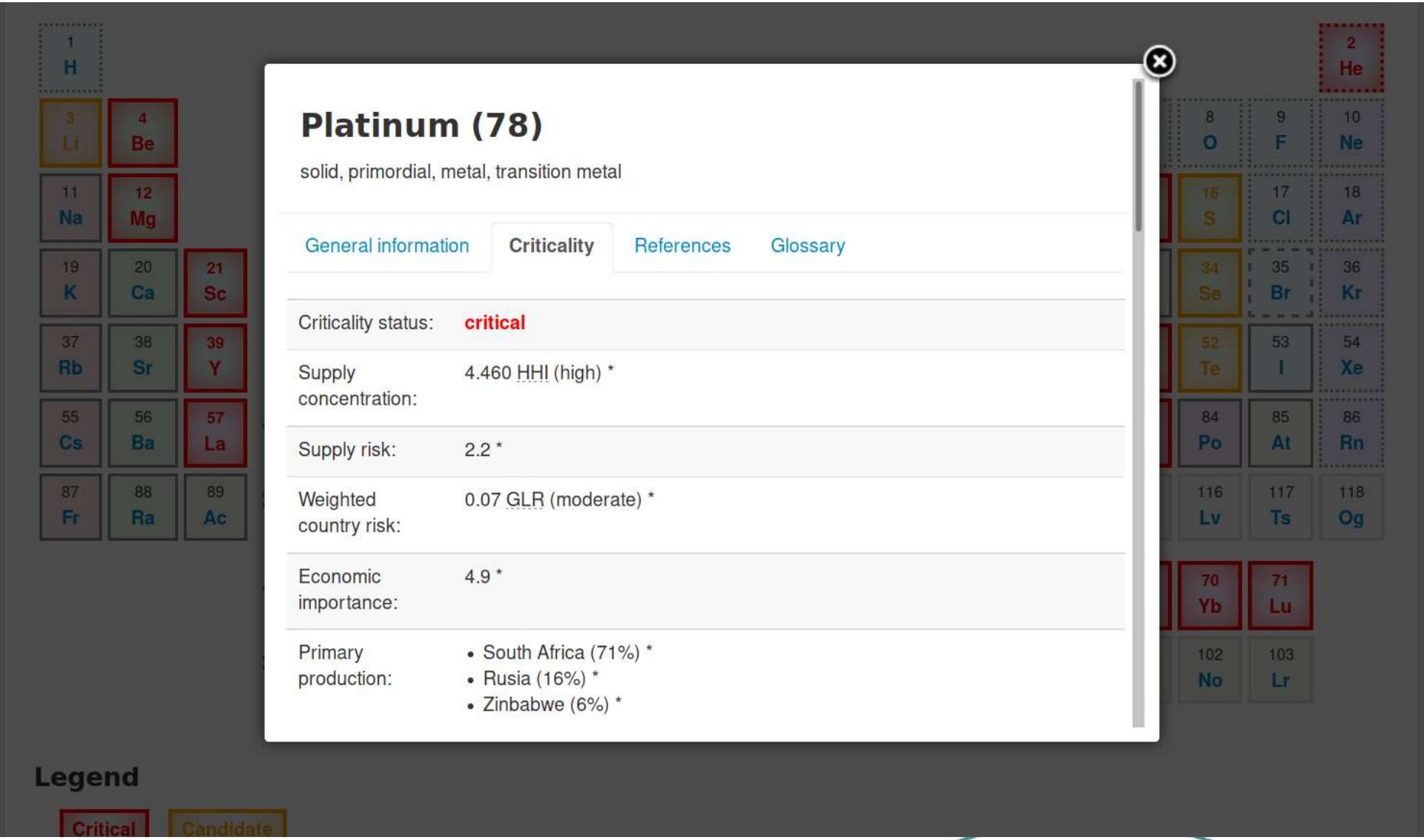
www.callparts.de

Making information available

Critical elements periodic table in development on the CCU website including the new information of the EU 2017 criticality assessment
https://tempro.uni-oldenburg.de/elemente



Database on CRM – Screenshot



Training the young generation: Scrappy Bird saves the planet

Android Version available on playstore

Conclusion

- High Potential for recycling of raw materials with improving material efficiency through consumer education and training.
- Without cascading materials, shortage of raw materials in **2050** very likely. Therefore, material efficiency through recycling must be improved.
- Circular economy also addresses open-loops without the engagement of OEMs (compare to closed-loop). These actors need more support since they are important players in efficiency.

Contact Us

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Research Focuses:

- *Remanufacturing supply chains and marketing systems*
- *Supply Chain Management and Product Lifecycle Management*

Join us for ICCCE 2018

https://iccce2018.com/

International Conference of Cascade-use and Circular Economy
Come to the Northwestern part of Germany: to Oldenburg (Lower Saxony)
September 24th and 25th, 2018

Thank you for your attention!

Dr.-Ing. Alexandra Pehlken
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References:

Selected as Cover Story: Kalverkamp, M.; Pehlken, A.; Wuest, Th. (2017): Cascade Use and the Management of Product Lifecycles. In Sustainability 9 (9), p. 1540. DOI: 10.3390/su9091540.P

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