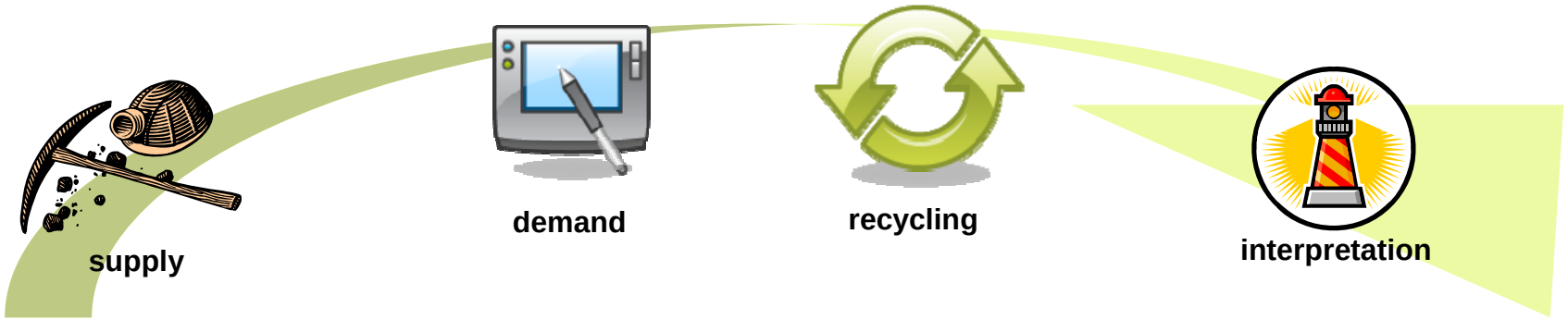

Resources Fever - Reloaded

Workshop II, Resource Conservation,
Green Transformation towards a Sustainable Policy for Europe,
Annual International Conference of the Öko-Institut,
5 November 2009, Brussels

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Resources Fever – Reloaded?

- **In June 2007 Öko-Institut has published “Resources Fever”!**

- **In this age the demand and the prices were booming for the most resources!**

- **2008/2009: global economic crisis: endpoint of resources fever?**

No, just a pause!

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Thesis 1: The demand on resources will increase remarkably in a mid and long term perspective!

- Growing global population, growing global economy and growing relevance of emerging economies will boost the demand on bulk materials (steel, copper, concrete etc.)!

- Sustainable future technologies will enhance the demand on precious and special metals*!

- The resource issue will achieve a new priority!

* Other terms: specialty metals, critical metals, green minor metals, rare metals etc.

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Thesis 2: Special and precious metals are crucial for modern industrial societies!

Indium pearls (photo by courtesy of Umicore Precious Metals Refining)

Critical metals for future sustainable technologies and their recycling potential

Issued by United Nations Environment Programme (UNEP DTIE)

July 2009

Funded by EU

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Assistance: Nicole Neurohr, Lorenz Hagelüken

Acknowledgement for profound and valuable information:
Umicore Precious Metals Refining, Hoboken, Belgium:
Christina Meskers
Christian Hagelüken
Thierry Van Kerckhoven
Kris Van den Broeck

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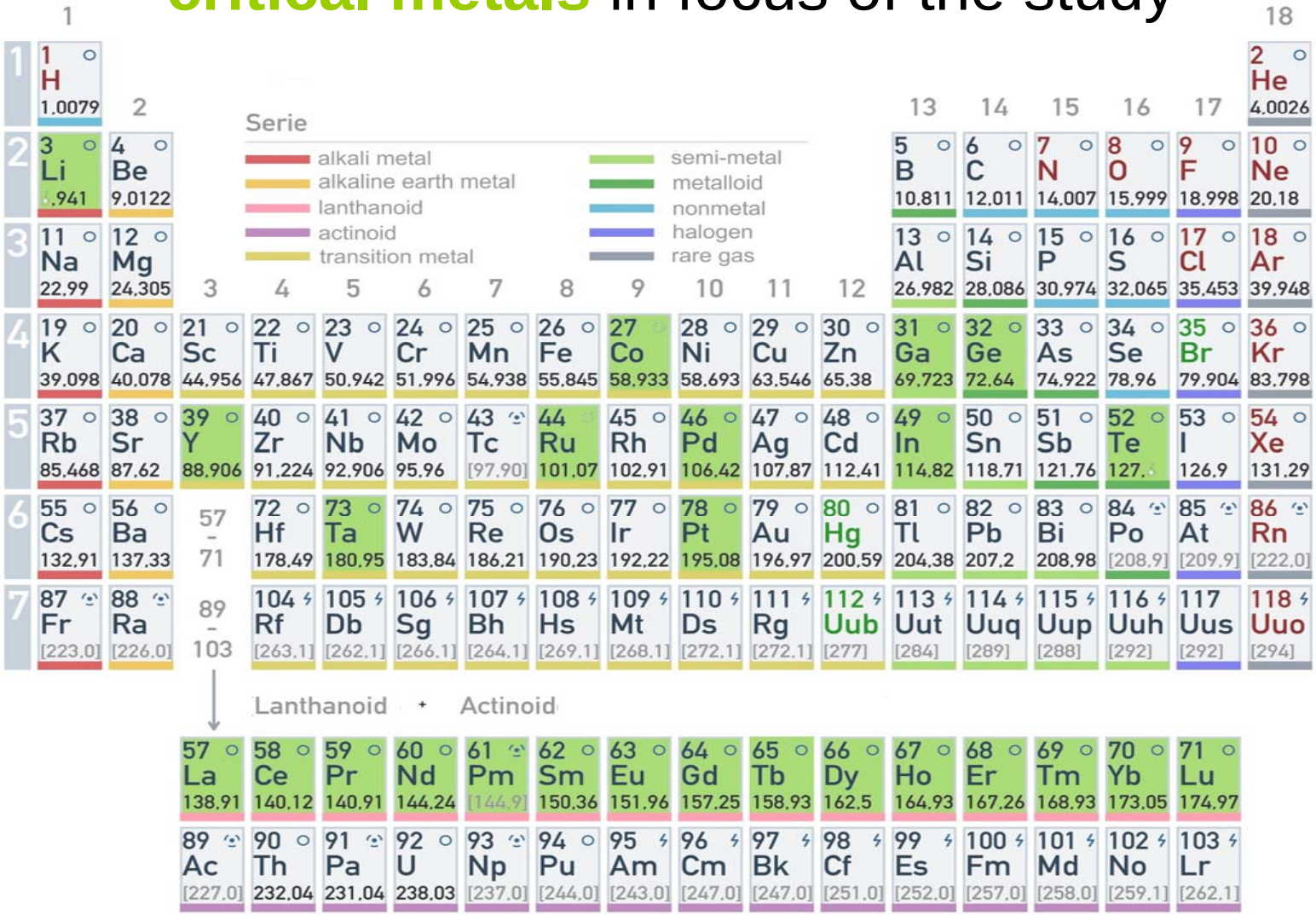
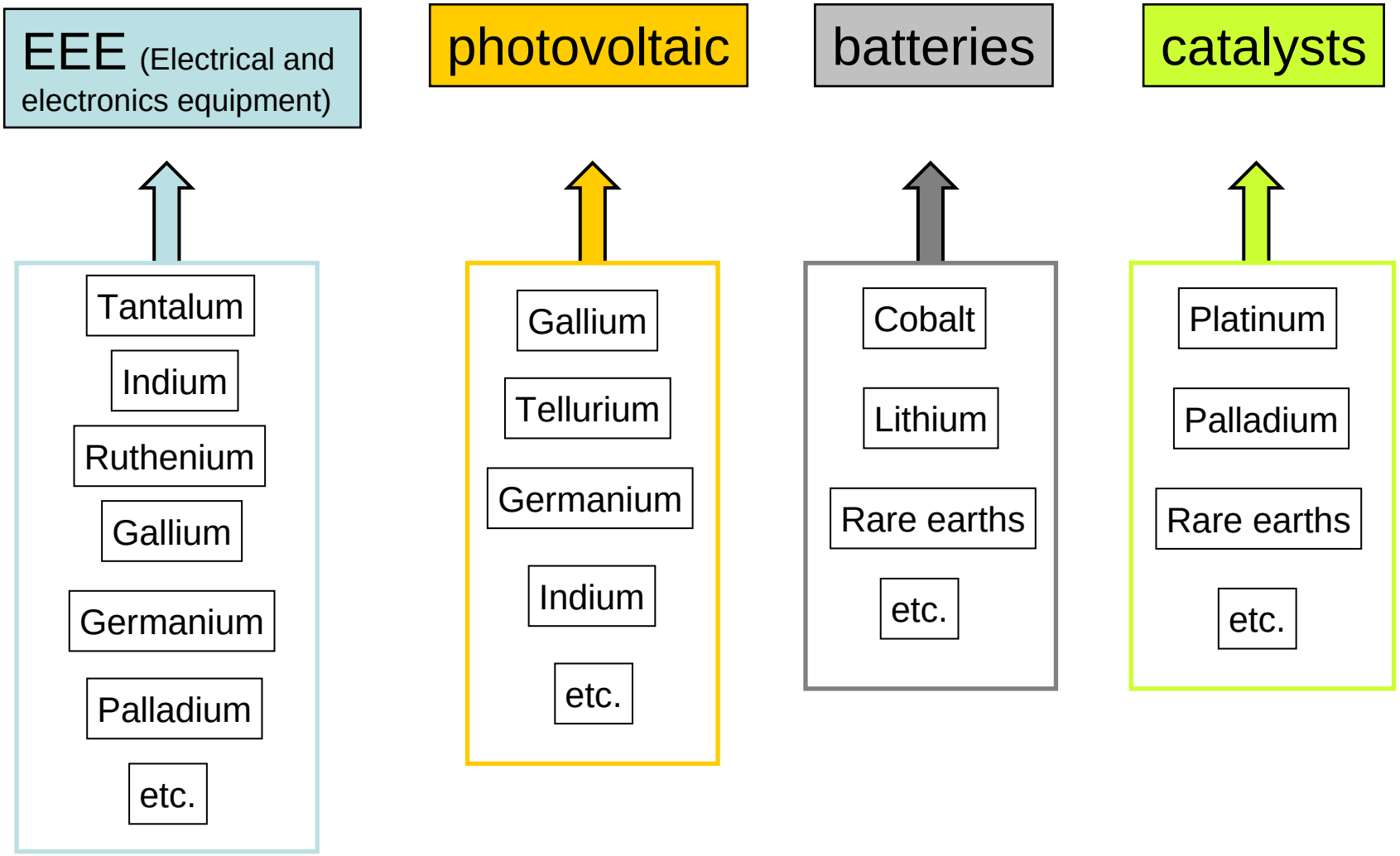
critical metals in focus of the study

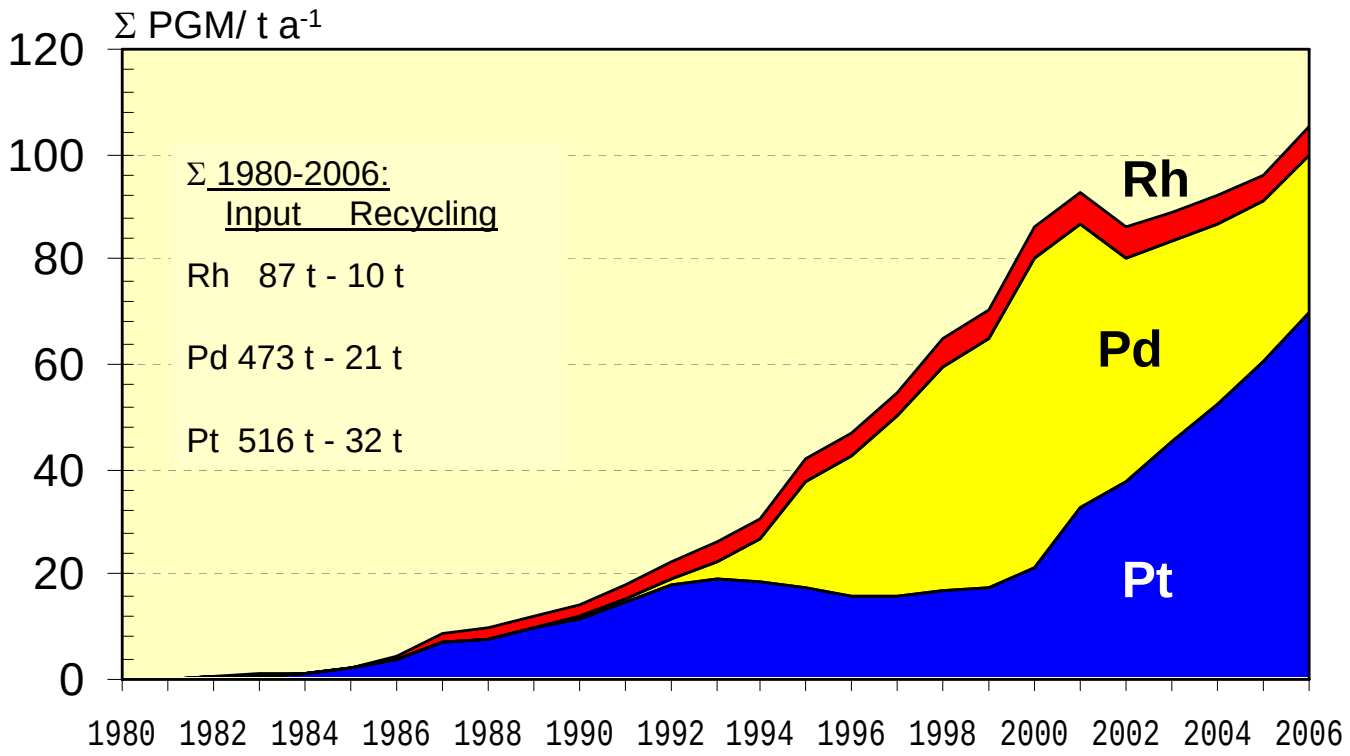


Examples for sustainable future technologies & therefore needed metals



Thesis 3: In Europe the mines for special and precious metals are above ground!

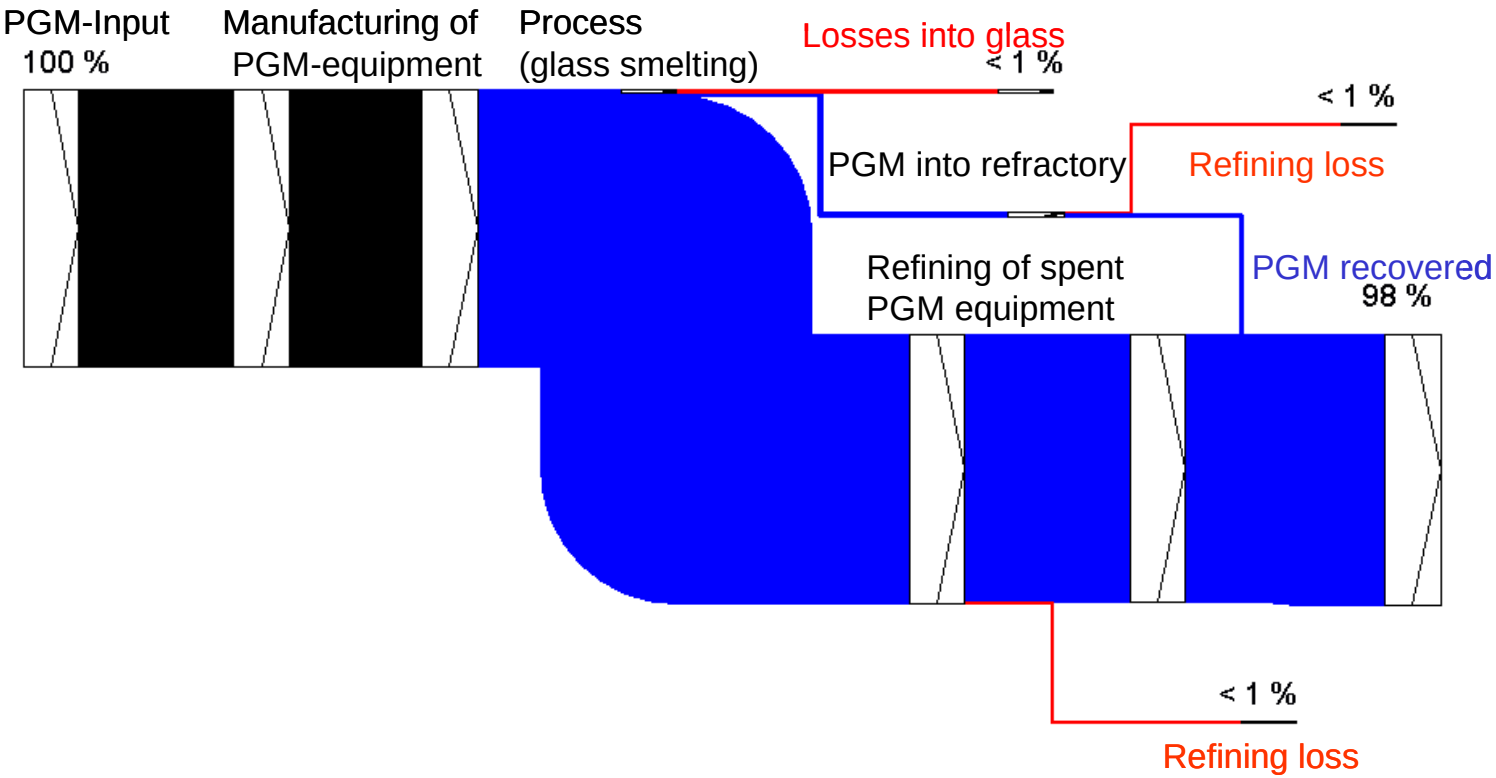
e.g.: Automotive catalysts: gross demand Pt,Pd,Rh in Europe



Data: Christian Hagelüken, Umicore, based on JM

Thesis 4: Europe could be the front-runner for recycling of critical metals!

Recycling streams in advanced systems
e.g. platinum group metals in glass industry



Materials flow of platinum group metals, Öko-Institut, Umicore, GFMS 2005

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Thesis 5: Despite existing recycling technologies total losses of critical metals are very common in the EU and worldwide!

- mobile phones: (< 10% EoL recycling rate: Cu, Au, Ag, Ta, Pd etc.)
- automotive catalysts: (ca. 50% PGM)
- LCDs: Indium (close to zero)
- batteries: Lithium (close to zero)
- In the future:
  Ga, Ge, In, Te from PV panels?

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Thesis 6: For green transformation Europe has to multiply the activities towards a recycling society!

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Preconditions for an optimized recycling in the future

- Enlargement of the global recycling capacities for many metals will be necessary in the next 1-2 decades!
  (e.g. PGM, Indium, Tellurium)
- Basic research, development and realization of new recycling technologies on metals with technical recycling problems
  (e.g. Tantalum, Rare earths, Lithium)
- Monitoring and controlling of illegal scrap-exports containing critical metals (e.g. WEEE)
- Know-how transfer and international cooperation regarding increasing stocks of used products in developing countries
  (e.g. old cars containing auto catalysts)

Action for the next 5 – 10 years

- Platinum und Palladium: 70% EoL recycling rate should be achieved until 2020 (today about 50%)
- "New" critical metals Indium, Gallium, Germanium, Tellurium and Ruthenium: appropriate post-consumer recycling infrastructures and well-shaped pre-treatment and refining technologies will be essential
- Tantalum, Lithium and Rare Earths: basic research in suitable recycling processes

Conclusions and recommendations

- Financial support by EU and other authorities regarding new recycling technologies for critical metals
- Special investment programs incl. low interest credits to support the design and realization of large scale recycling plants
- Continuous improvement of the legislation system (e.g. extension of the WEEE Directive regarding photo-voltaic modules)
- Establishment of Best Practice Guidelines for the entire recycling value-chain (knowledge input from different stakeholders)
- Know-how and technology transfer and international cooperation regarding increasing stocks of used products in developing countries (e.g. old cars containing auto catalysts)

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Thank you for your attention!

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