

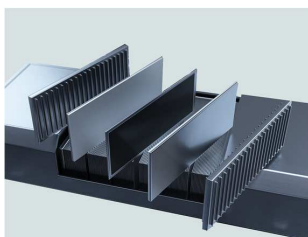
Session 1

Mr. Jan Tytgat, Director Government Affairs EU, Umicore, Belgium



Who we are

A global materials technology and recycling group



A global leader in automotive catalysts for internal combustion engines, hybrids and fuel cell powered vehicles



A leading supplier of key materials for rechargeable batteries used in electrified transportation and portable electronics



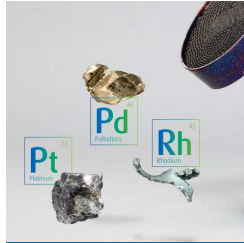
The world's leading recycler of complex waste streams containing precious and other valuable metals

Sustainability along the value chain



Sourcing:

- OECD-guidelines
- Regulatory framework



Production

- C-footprint
- Resource efficiency



Use phase

- Optimisation
- Lifetime extension



End-of-life

- Collection (quantity)
- Recycling (quality)

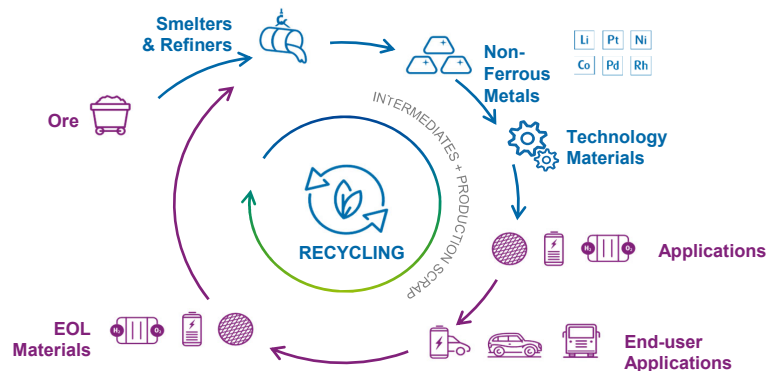
Responsible Sourcing

OECD guidelines

- Basis for several voluntary industry schemes on responsible sourcing
- Human rights; Environment; Governance

Regulatory framework

- Conflict minerals: Sn, Ta, W, Au: focus on HR; limited to smelters & refiners + metals import → many leakages
- Battery Regulation: Ni, Co, Li: focus on HR, EHS, Governance; value chain approach
- Corporate social responsibility & Responsible business conduct: new EU initiative covering 'all' aspects

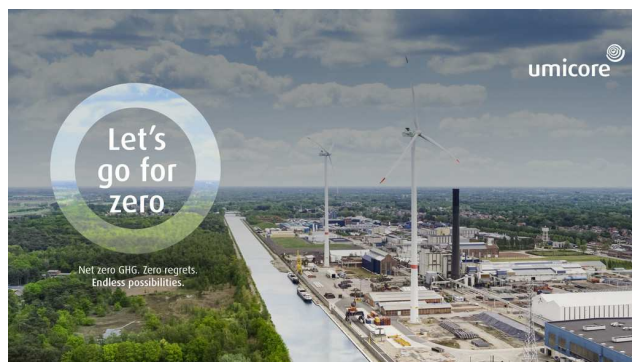


Production phase



Major envi-impacts: C-footprint and resource depletion

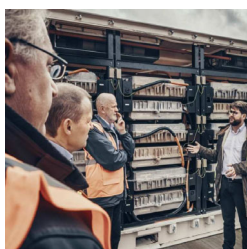
- C-footprint
 - Fitfor55 framework will encourage companies to reduce C-footprint
 - Battery Regulation will cap max C-footprint
- Resource efficiency: 'doing more with less'.
Examples:
 - Car catalyts if today perform better but contain less PGM's than 10 years ago
 - LiB's: less Co, better performance
 - Secondary raw materials



Use phase

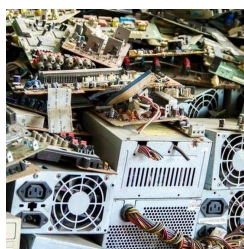


Industry and society need to think about how to be more efficient



Lifetime extension

- Reuse of EV batteries for stationary applications



Lifetime extension

- Repairability of electrical and electronic equipment



Optimization

- Size: do we need an SUV to go to the bakery?



Optimization

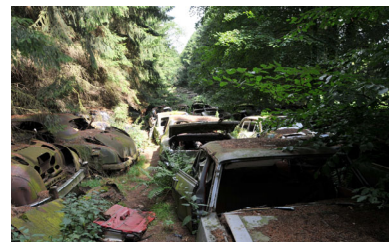
- Use intensity: cars are idle during 95% of the time → car sharing!

End-of-life

More collection and better recycling are needed

Collection (quantity)

- Too much leakage, ex:
 - \pm 50% of EU cars are 'lost': no authorised EoL treatment, no legal export
 - Merely 10 % of portable LiB's (from WEEE) end up in LiB recycling \rightarrow losing the equivalent of a Co mine every year



Recycling (quality)

- Exported waste is not recycled under 'equivalent conditions'
- Poor metrics result in 'fake' recycling and downcycling
 - Fake: reported as recycling but never ending in new goods
 - Downcycling: recycled for lower end application (can be justified but not for most critical raw materials)



Conclusions

Policy recommendations on EU level

- **Responsible sourcing:** A "smart mix" of minimum compulsory due diligence requirements, ambitious industry initiatives and incentives, as recommended by Eurometaux
- **Minimizing production footprint:** go for zero C-emissions and reduce primary material use by improved product design and use of secondary raw materials
- **Conscious use of the materials** in their applications; encourage life extension, make the sharing economy attractive, avoid 'overdesign'
- **Keep materials in the loop:** high collection targets and quality recycling must be enforced by an effective regulatory framework; leakage and substandard recycling must be avoided



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materials for a better life

Contact: jan.tytgat@umicore.com