Carbon footprint @

Umicore Precious Metals Refining

Circularity for critical metals

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How did Umicore contribute?

Representative dataset on bottom ash treatment

- Key challenge to all footprint studies is data availability. For waste treatment, this is even a bigger challenge:
  - Wide variety in waste composition makes it difficult to find a representative process in databases
  - Usually low/no value output, hence no incentive to start data collection

- The 2 most important footprint questions from material suppliers on the Hoboken process:
  - What is the footprint to process 1 ton of my material?
  - What is the footprint of the recovered metals?

- Umicore Precious Metal Refining (PMR) generates footprint data since 2020. With this, Veolia was able to use representative data in their model. The data account for the actual impact of the treatment.

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Umicore PMR & Carbon Footprint

Precious metals (Au, Ag, PGMs) in ppm – base metals (Cu, Pb, Ni) in %
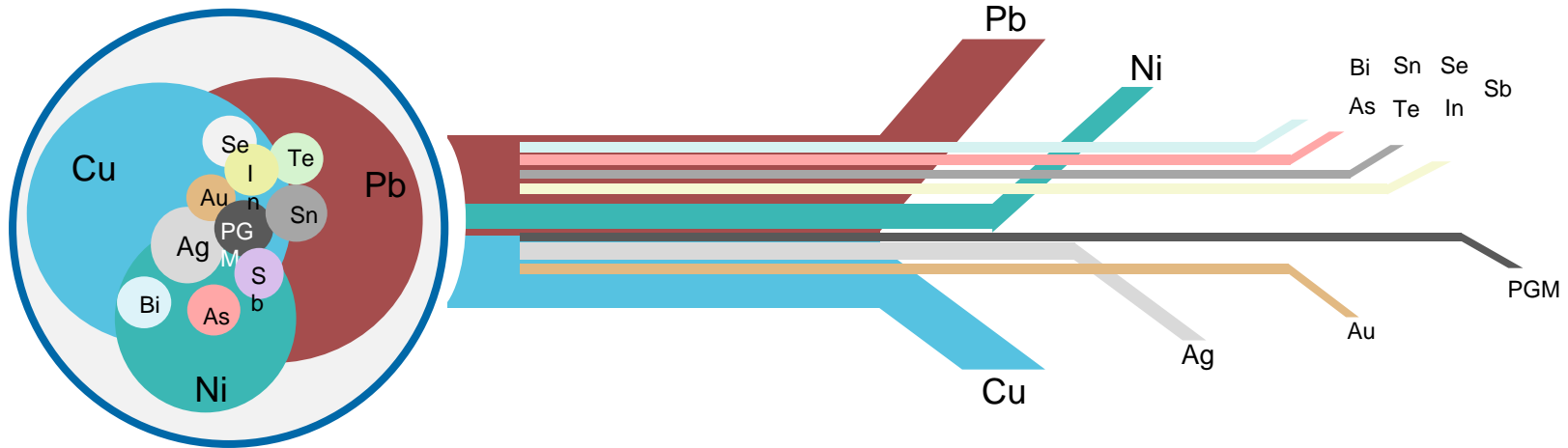
- PMR supply mix : base metals in high %, special metals in low %, precious metals in ppm.

- Focus on complex raw materials: PM's + non-PM, impurities, heterogeneous,…

- Total carbon emission of PMR, Hoboken works is allocated to all 17 metals produced.

→ Use of economic process cost allocation model. This model is accepted by CIRAIG + based on LCA conform ISO14044

Umicore footprint methodology

New method fully representative for the business model

- ISO standard has a hierarchy to handle multi-output (allocation) challenges in LCAs:
  1. Avoid allocation – not possible in Hoboken as multiple metals exist at all places
  2. Apply allocation based on underlying physical properties: mass/calorific content are often used
  3. Apply allocation based on other properties: value is often used

- The metal industry developed further guidance for multi-output cases of metals only:
  1. Mix of base metals only – apply mass allocation
  2. Mix of base and precious metals – apply economic allocation based on metal price

- None of the approaches represent the business reality in Hoboken. Business model is based on fees customers pay to treat material, since recovered metals are often property of customer.

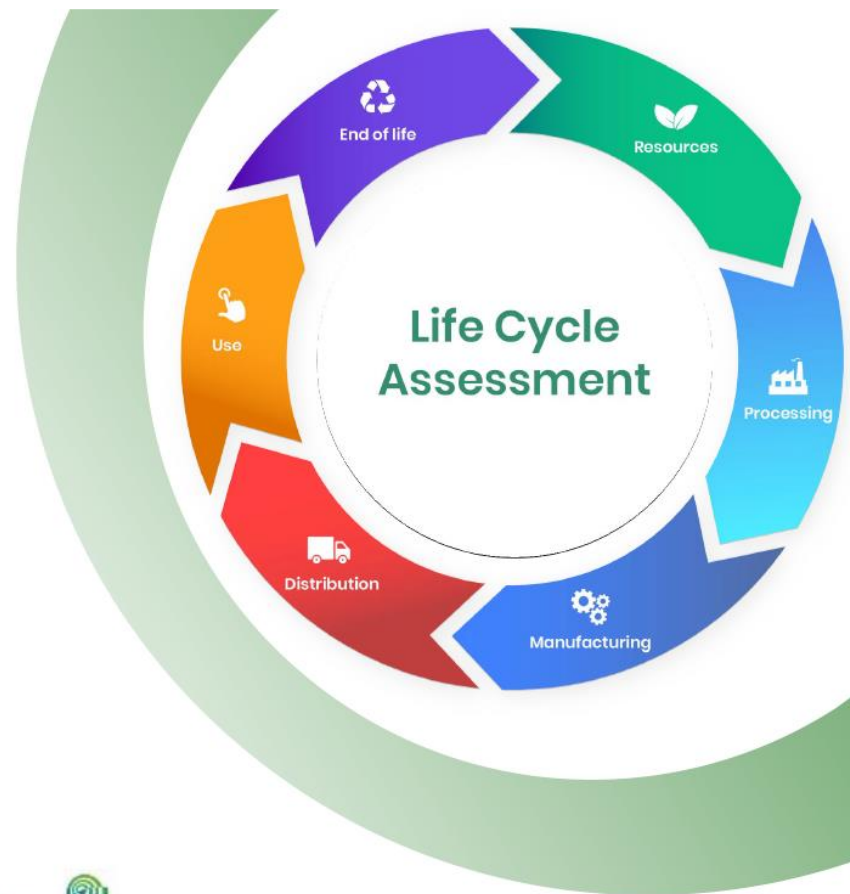- A new economic allocation method using process cost was developed.

Meeting the project needs

Data shared with CO2logic

- 2022 data for the bottom ash material provided to CO2logic for 9 impact categories
    - per kg metal recovered from the bottom ashes
    - Per kg bottom ash treated

- Direct interaction between CO2logic and Umicore ensured Umicore data followed the methodological requirements of the Veolia study while overcoming data confidentiality issues.

Life Cycle Assessment in IBA & Nfe processing?

- Make **all environmental contributions** transparent

- In a way that is **verifiable**, **quantifiable** and **auditable: manage your data!**

- **Identify** the parts with **highest impact** and act on those

- **Overcome the data gap: interlink** LCA across sectors and activities

- With an easy means **to communicate**: internally & externally

Life Cycle Assessment

End of life · Resources · Processing · Manufacturing · Distribution · Use

CO₂logic | a south pole Company   VEOLIA   umicore