THE PROMISE AND LIMITS OF URBAN MINING

Luis Tercero, Leon Rostek, Antonia Loibl & Denis Stijepic
Webinar hosted by Fastmarkets & CESCO, sponsored by ICA | November 2020
What is Urban Mining?

- People and everything made by people belong to the anthroposphere
- The anthroposphere contains a wide variety and vast amounts of materials
- Urban Mining aims to manage and use these materials as a source of raw material supply
  - utilize the waste of today
  - anticipate and capture the value contained in the waste of tomorrow
- All metals and minerals in the anthroposphere came from “conventional” mining
Urban Mining is an integral part of the Circular Economy
How the Urban Mine grows: Tailings, stocks in use and landfills

FROM MINING OPERATIONS

TAILINGS
essentially no outflow to date

RESIDUES AND NOT RECYCLED EOL PRODUCTS

LANDFILL
essentially no outflow to date

Service lifetime

inflow – outflow = net addition to stock
Global and regional Urban Mines (copper, 2018)
Mining the Urban Mine: Theoretical vs. recoverable potential

Theoretical potential

IN USE

RECOVERABLE POTENTIAL

RECOVERED POTENTIAL

DISSIPATION

NOT COLLECTABLE

NOT RECYCLABLE
The long chain between discards and recovered raw materials

- The Urban Mine is distributed worldwide
- Main driver for recycling is profitability
- Material value must pay for
  - logistics
  - processing
  - all other costs (financing, compliance, etc.)
Recycling indicators and why they matter

- Measure efficiency along the chain
  - EoL collection
  - EoL separation (shredding etc.)
  - EoL processing (incl. metallurgy)
  - EoL recycling as a whole

- Measure independence from geological resources
  - Secondary input to metal production
  - Secondary input to manufacturing
  - Overall and EoL only
Trade-offs in Urban Mining

- PUBLIC HEALTH
- RESOURCE CONSERVATION
- RESOURCE EFFICIENCY
- SELF-SUFFICIENCY
- COSTS/REVENUE
- CLIMATE CHANGE
- SUPPLY SECURITY
- ENVIRONMENT
- CIRCULARITY
- URBAN MINING
- LOCAL VALUE CHAINS
- WORKER’S HEALTH & SAFETY
- MATERIAL QUALITY
Who can support Urban Mining and how?

- **Governments**
  - Adequate infrastructures
  - Regulation
    - Clear
    - Strict
  - Internationally uniform

- **Industry**
  - Manufacturing
  - Recycling
  - Product information
  - Whole-chain optimisation
  - Design for dismantling
  - Recovery from complex products
  - Recycling-friendly alloys
  - Research and technology development
  - Global availability of technologies

- **Public**
  - Has access to collection systems
  - Informed
  - Committed
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