

Turning waste into a potential resource

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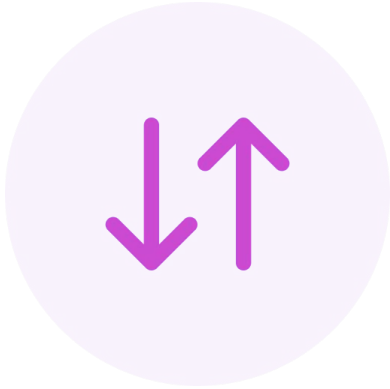
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Qosmo Hotel, Braşov, Romania

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slido



**How many unused
electronic devices do you
have stored at
home/office?**

① Start presenting to display the poll results on this slide.

slido

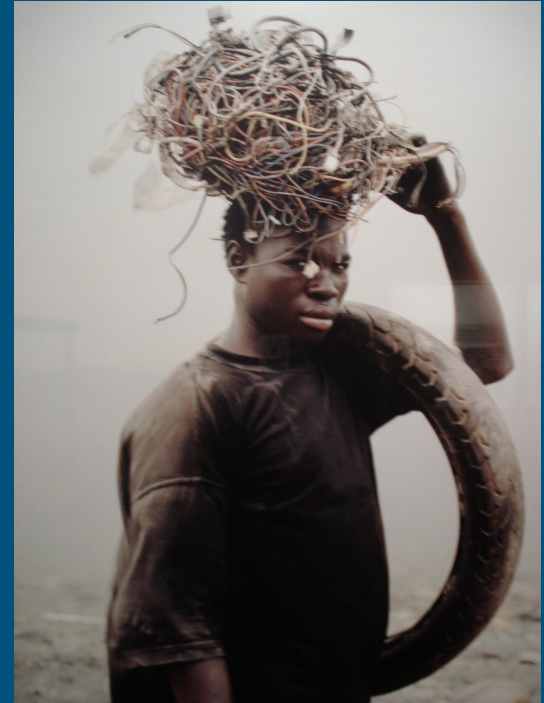


**Why did you not dispose
of these unused electronic
devices?**

① Start presenting to display the poll results on this slide.

Personal motto

YouTube documentary:
Toxicity life at Agbobloshie, the world's largest e-waste dump in Ghana.

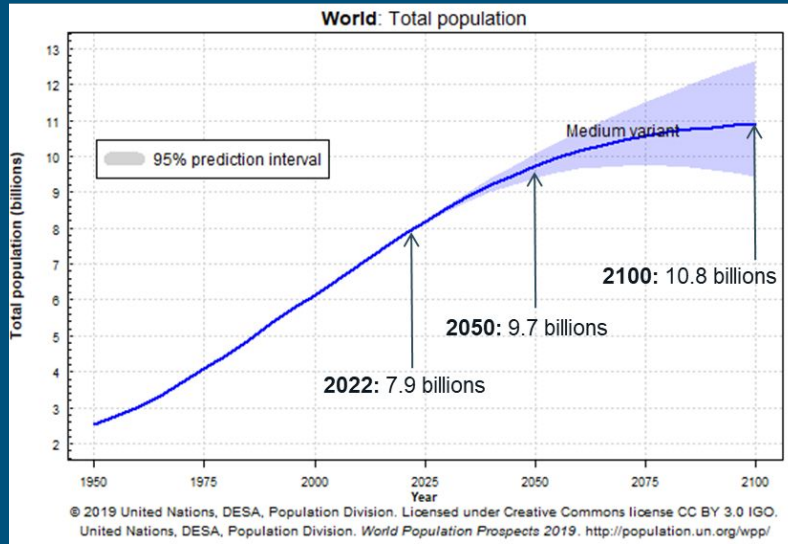


© Pieter Hugo
Permanent Error, Agbobloshie, Ghana 2009-2010
Fotografiska Museum, Stockholm, Sweden (2012)

Global Challenges for Natural Resources Scarcity

Global population growth & building development

Non-metallic minerals (e.g., sand, gravel, clay deposits)



UN World Population Prospects, 2019

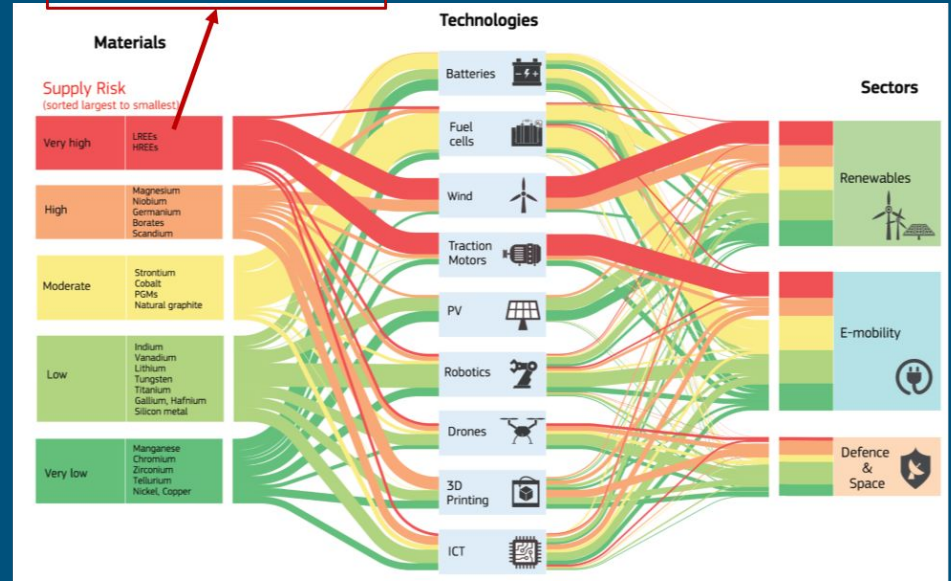
Non-metallic minerals represented **48% of global material extraction** (43.8 billion tonnes) VS **Metallic ores** represented **10% of global material extraction** (9.1 billion tonnes) (UNEP-IRP, 2019)

EU technological development, energy transition & living standards

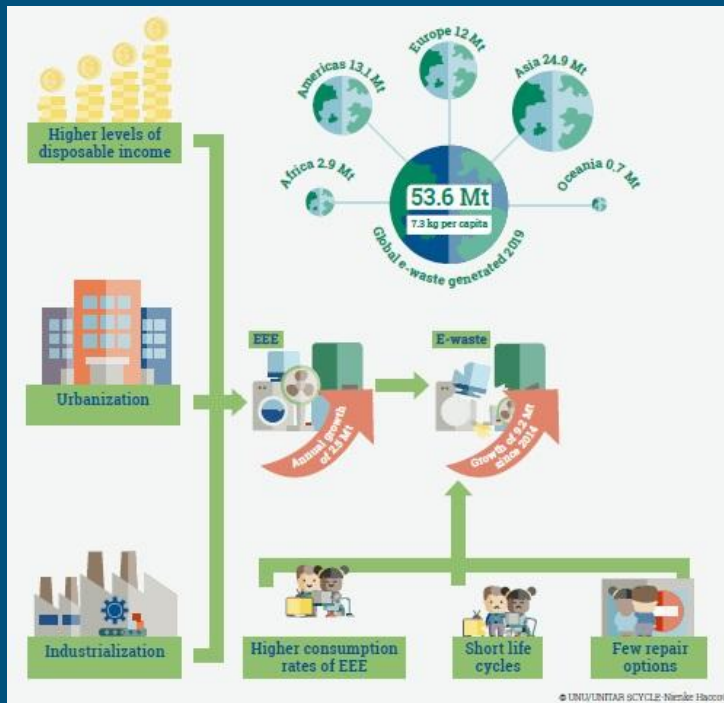
Metallic ores (e.g., base, precious, and critical metals)

Chinese ownership (market share):

LREEs (99%)
HREEs (98%)



E-waste challenges



Main challenges of electronic waste management:

- **High volume** (53.6 Mt in 2019 □ 74.7 Mt by 2030);
- **Fastest growing waste stream** (new models release and short life span - 22 months per person for mobile phone);
- **Decentralised waste** (urban dispersion);
- **Inefficient repair/reuse/recycling schemes** (non-existing, pricey or inconvenient);
- **Lack of financial incentives** (reward sustainable practices with sustainable services/products);
- **Lack of (stricter) e-waste legislation** (78 countries covered by legislation, policy and regulation in 2019 □ 97 countries by 2023).

What do WEEE-DO?



Giving unused electronic devices a better home.

Utrecht,
NL



Dispose of
Your Unused
Electronic
Devices



Use Existing
Low-Carbon
Delivery
Systems



Make Use of
Unused Storage
Capacity of
Delivery
Systems



Condition
Assessment
Scan



Repair & Resell
Recycle



Earn Credits in
Our Circular
Shop and
Delivery
Partners

What do WEEE-OFFER?



Giving unused electronic devices a better home.

Utrecht,
NL



Individuals/Companies

- Direct Pick-Up System
- Free Up Storage Space
- Reward (online shop credit)
- Report on device's end-use



Repair & Recycling

- Customer Supply

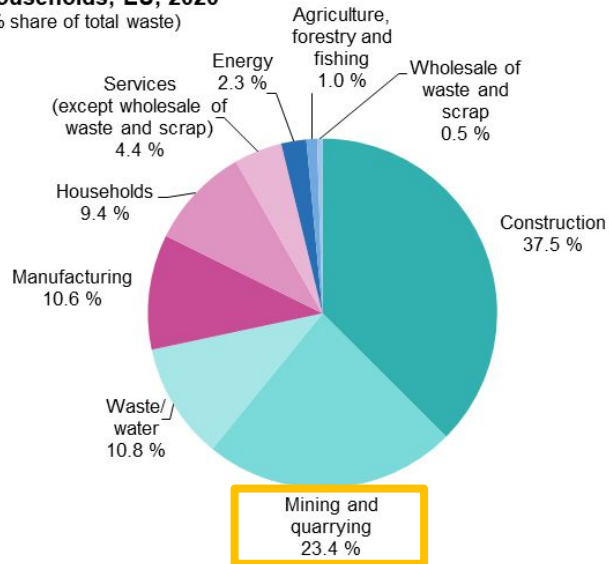


Delivery Companies

- CSR
- Green Branding
- Client Retention
- Reverse Logistics

Mine waste challenges

Waste generation by economic activities and households, EU, 2020
(% share of total waste)



2nd biggest waste stream in the EU!

Source: Eurostat (online data code: env_wasgen)

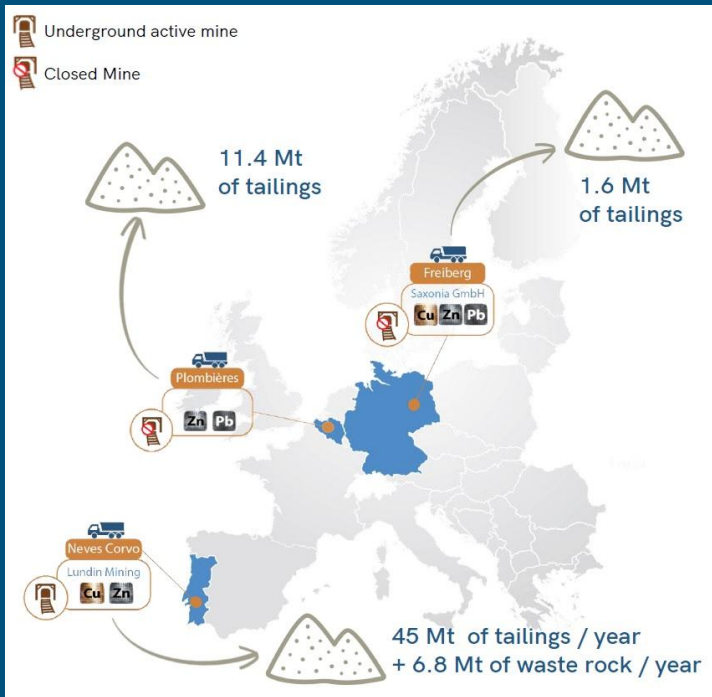
eurostat 

Main challenges of mine waste management:

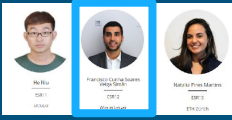
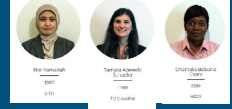
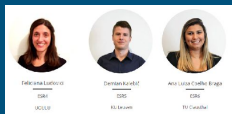
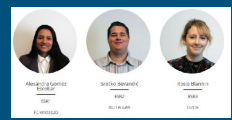
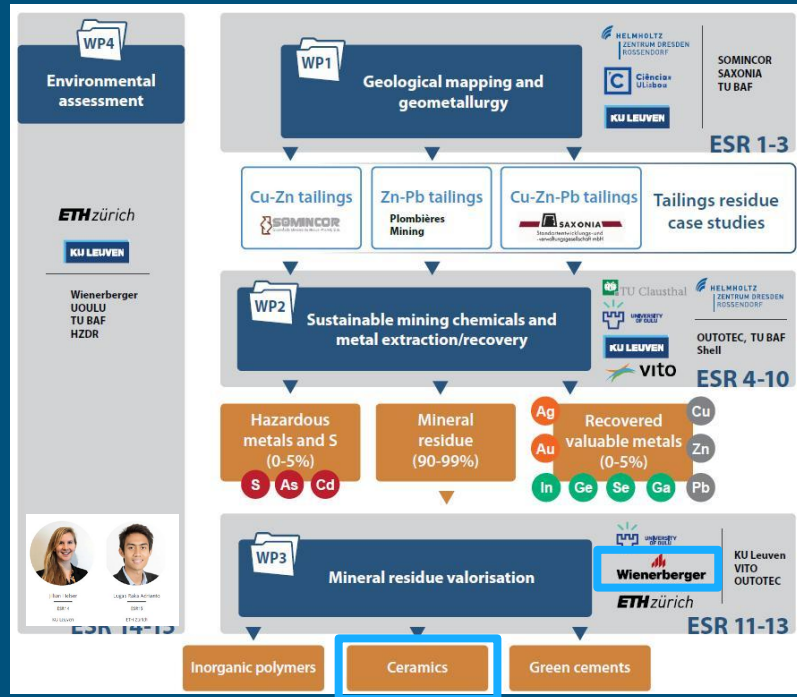
- **High volume** (~600 Mt/year + 28 Bt old stockpiles in the EU);
- **Heavy weight** (Brumadinho tailings pond collapse, Brazil);
- **Open air disposal:**
 - **Environmental threat** (acid/alkaline mine drainage, affecting ecosystem and food chains);
 - **Health hazards** (fine tailings particles can affect visual and respiratory systems);
 - **Social prejudice** (noise/traffic for populations nearby).
- **Low-impact techniques to valorise mine waste** (recover valuable metals and bulk mineral residue).

EU H2020 MSCA-ITN-ETN SULTAN

Case study locations + mine waste stocks



Early Stage Researchers (ESRs) + Work Packages (WPs)



SULTAN PhD Research

Cradle-to-gate LCA



Learning outcomes

WEEE-DO, giving unused electronics a better home:

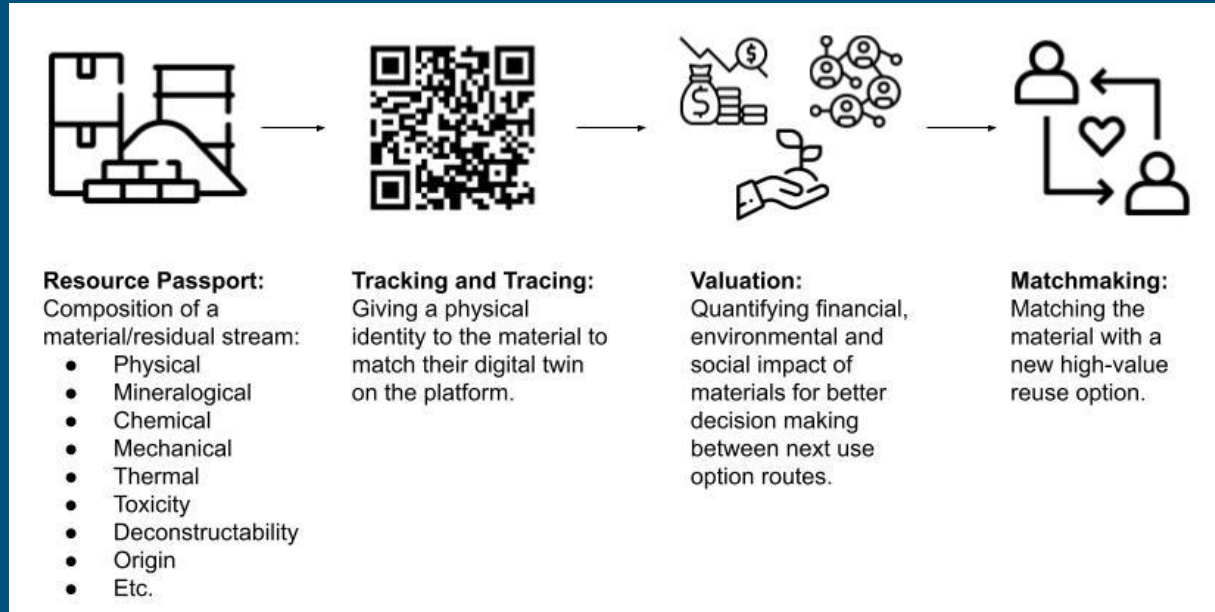
- Individuals need a financial reward to more easily dispose of their unused electronic devices;
- Companies/Institutions only need a collection service with follow-up report on the 2nd life of devices;
- Roadblocks: electronics producers take-back system, privacy data issues, technical access to devices, higher repair costs than resell price;
- EU regulations on recycling targets w/ minimum amounts of kg/capita (boosting reuse/recycling of e-waste).

SULTAN, turning mining waste into a ceramic resource:

- Up to 40wt% of untreated mine waste used as partial/total alternative material for recyclable ceramics;
- Treatment/leaching techniques need optimisation for elements separation depending on valorisation route;
- Roadblocks: mine waste is stored in open air with chemical-mineralogical modifications, economic benefit for ceramic industry, environmental recover already done in old mining sites (how to re-mine?);
- EU regulations for responsible mining in coming years (boosting recycling of mine waste).

We need more “Tinders” for alternative raw materials!

Database of alternatives materials (EU DPP initiative)



Adapted from Excess Materials Exchange (EME) Platform

A dating platform, where excess materials meet demands.

[excessmaterialsexchange.com](https://www.excessmaterialsexchange.com)

Food for thoughts



During my PhD research around 120 trees were planted. Join the movement and use [ecosia.org](https://www.ecosia.org) as your default web search engine for surfing the web while planting trees!

50 searches = 1 tree

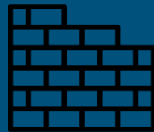
During this presentation:



Roof tiles

8470 pcs¹ / 15 min

¹ Considering 2/2 Belgian production plants (5 production lines)



Blocks

324 pcs² / 15 min

² Considering 1/3 Belgian production plant (1 production line)



Waste



???

Mt



Resource

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Drivers of climate innovation in Europe and beyond.



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Transforming Europe's Cultural & Creative Sectors and Industries.



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For a strong, digital Europe.



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EIT in Europe - Map

The EIT Community operates across Europe in Innovation Hubs. Find out where!

What is EIT Alumni?

The EIT Alumni Community brings together an interdisciplinary and multicultural community of professionals, comprising graduates of the EIT's education and business creation programmes.



EIT Climate-KIC Alumni



Community by EIT InnoEnergy



EIT Health Alumni



EIT Digital Alumni



EIT RawMaterials Alumni

Connect
Collaborate
Innovate

Thank you for your attention & remember: It's a waste to waste waste!

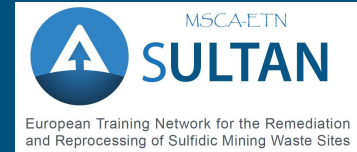


Funded by the European Union

JUMPSTARTER

WEEE-DO

This project has received funding from the EIT Climate-KIC Greenhouse Pre-Incubation Programme 2019 and the EIT Jumpstarter Competition Phase 2 2019.



SULTAN

This project has received funding from the EU's Framework Programme for Research and Innovation Horizon 2020 under Grant Agreement No 812580.