



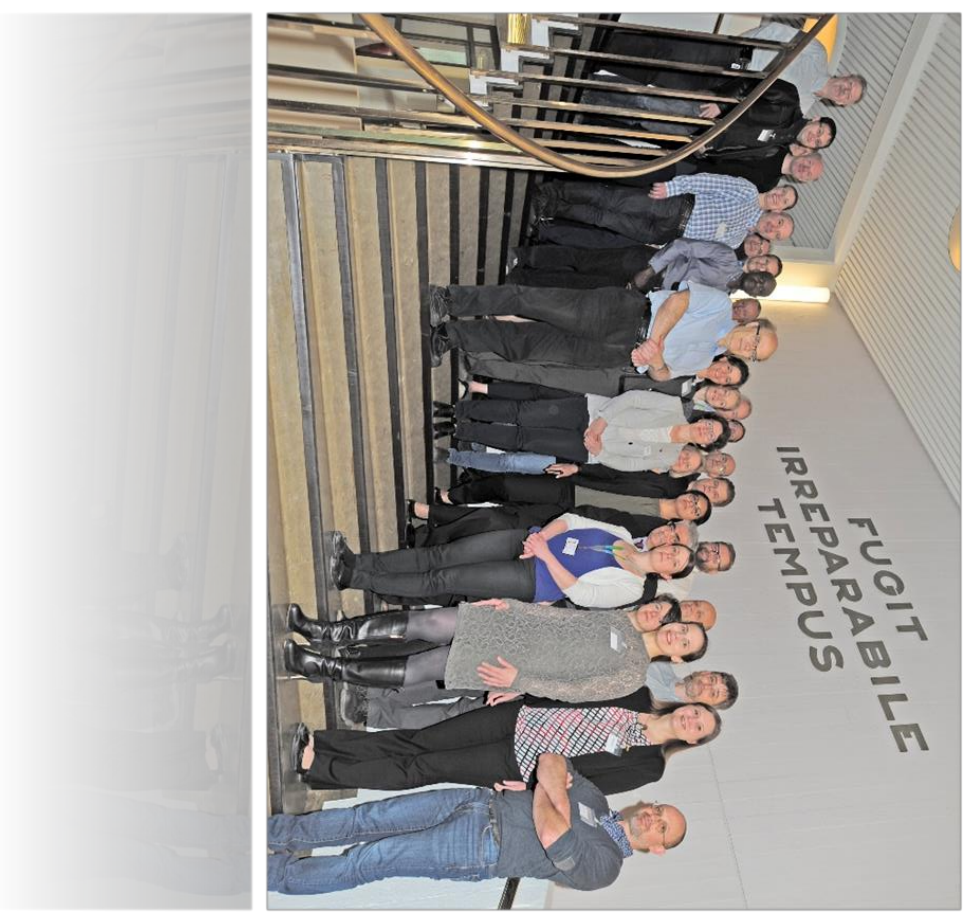
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Integrated mineral technologies for more sustainable raw material supply.

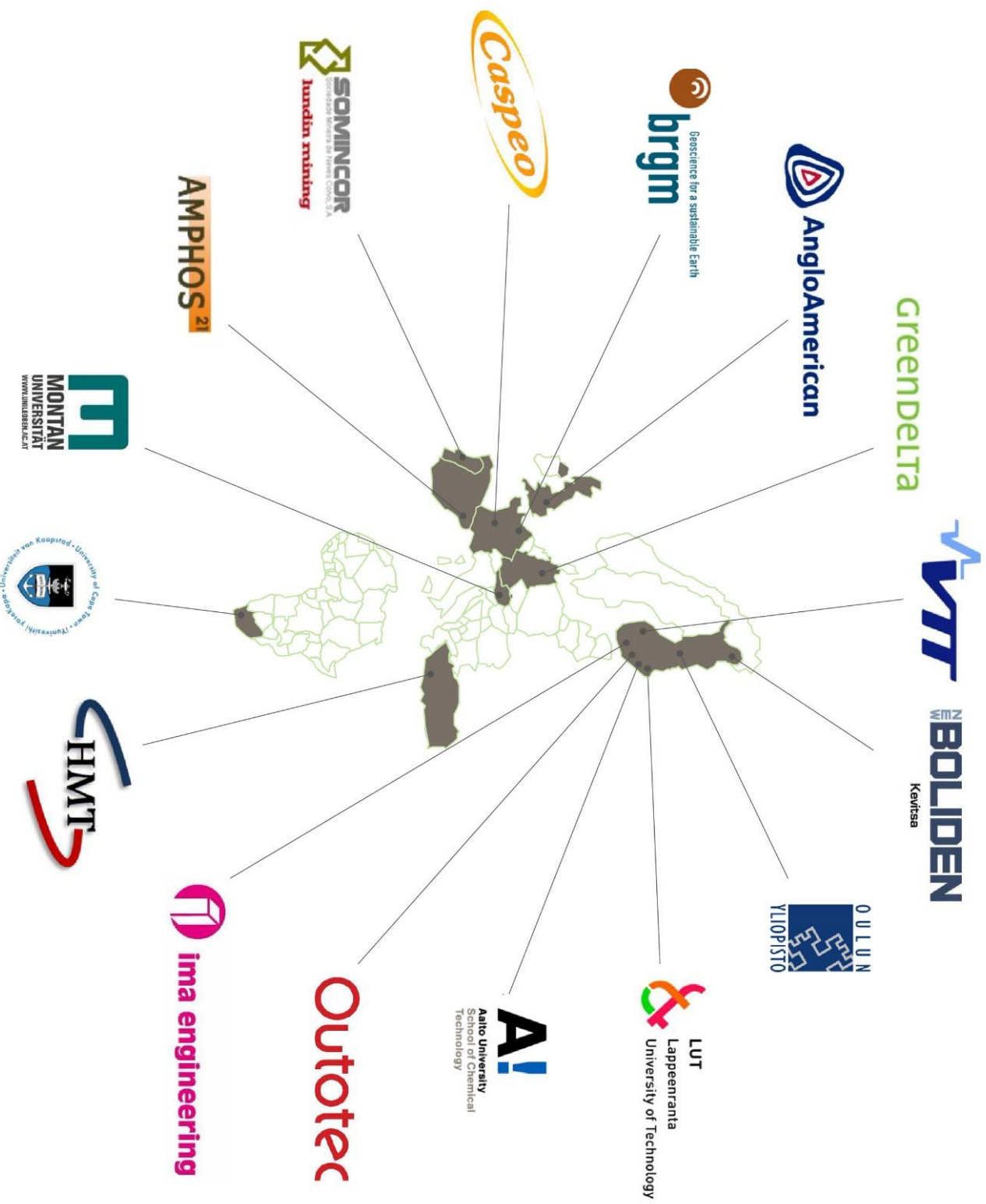
# ITERAMS

Integrated Mineral Technologies for More Sustainable Raw Material Supply

- Integrated Mineral Technologies for More Sustainable Raw Material Supply
- Addresses H2020 issue “Sustainable selective low impact mining”
- 3 years: 1.6.2017 – 31.5.2020
- 7.9 M€ budget
- 16 partners
  - 9 industrial partners, 2 RTOs and 5 universities
  - From 7 EU Member States (Finland, France, Austria, Germany, United Kingdom, Spain and Portugal)
  - Additionally from Turkey and South Africa
  - VTT coordinates



# PARTNERS



To develop and obtain a **NEW PARADIGM**  
**PROOF OF CONCEPT** at mine sites to



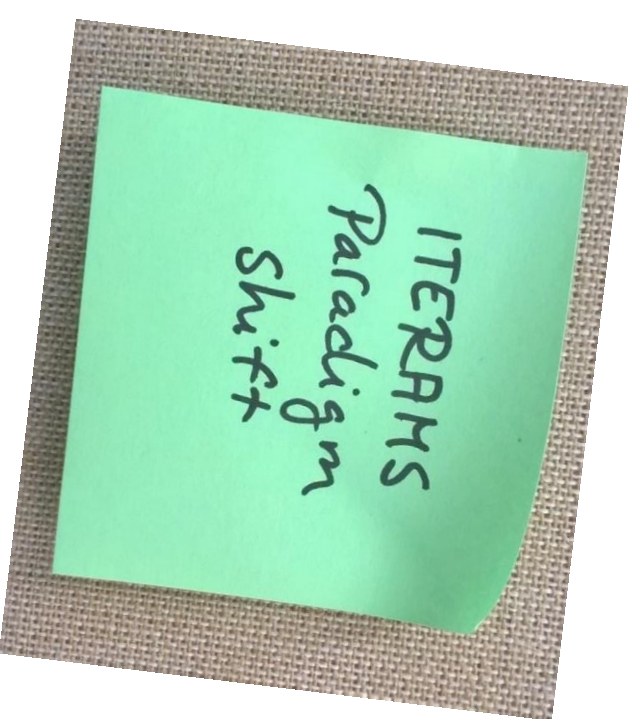
recycle water and



valorise tailings



for an improved environmental  
and economic result to enable  
future sustainable mineral supply  
in Europe.





- From water handling cost minimization
- to taking care of water properties and optimizing these properties for each process step. New water reuse concepts.



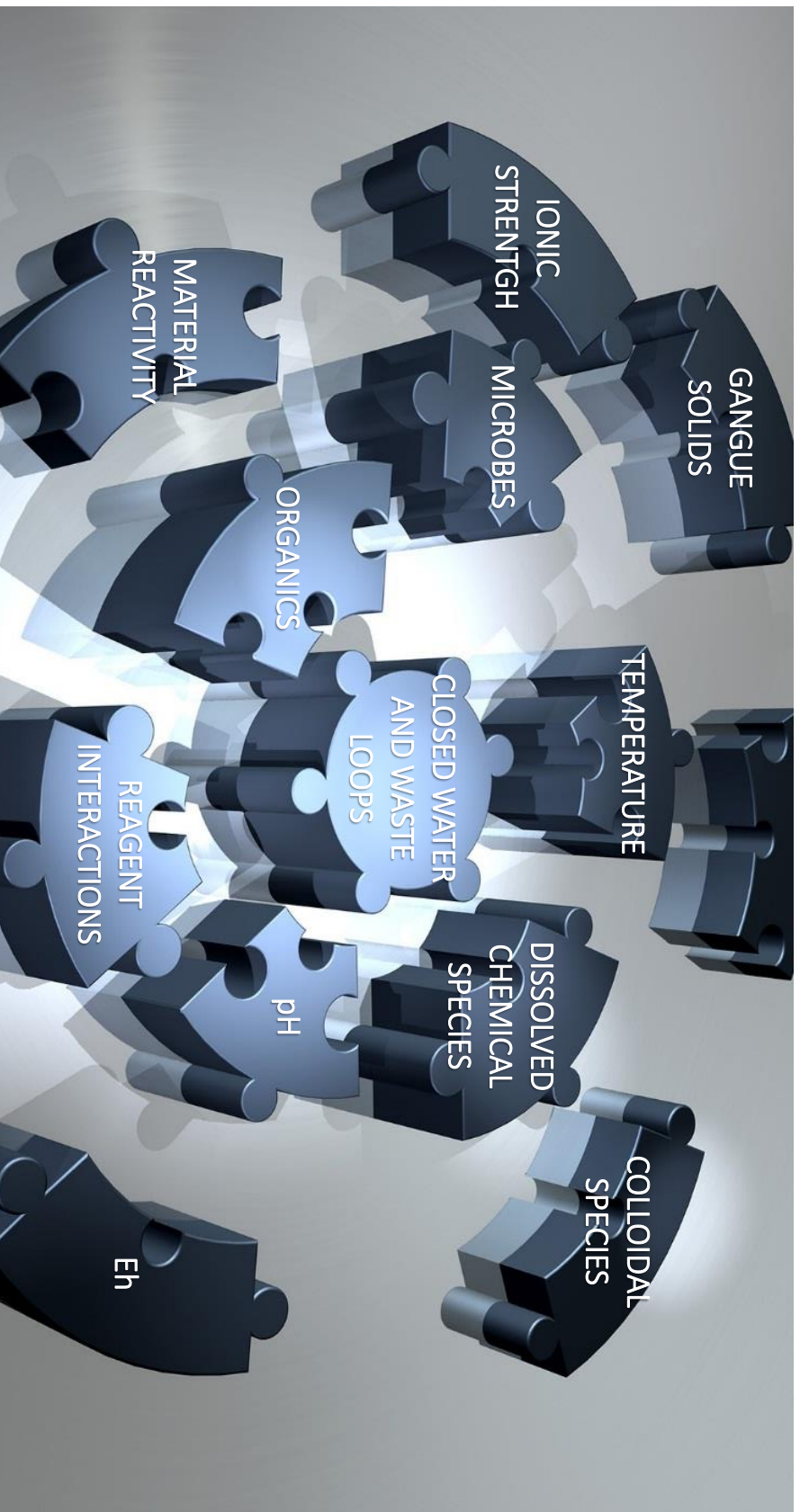
- From depositing waste rock and tailings
- to utilizing waste rock and tailings for added revenue as hardening mine fill or products. New ways of safe depositing of remaining tailings.





# CHALLENGE

- Complete closure of water loops increases thermodynamical and kinetic instability and process disturbance
  - ITERAMS creates capabilities via laboratory experiments, modelling and validation at mine sites to tackle this complexity



## SUSTAINABLE MINERAL SUPPLY IN THE EU

Economical, environmental and social sustainability

### EFFICIENT WATER RECYCLING

- ✓ Reduction of water consumption by >90%
- ✓ Water quality optimization for each process step
- ✓ Recovery of valuable constituents from water solutions
- ✓ Efficient and economical water treatment methods

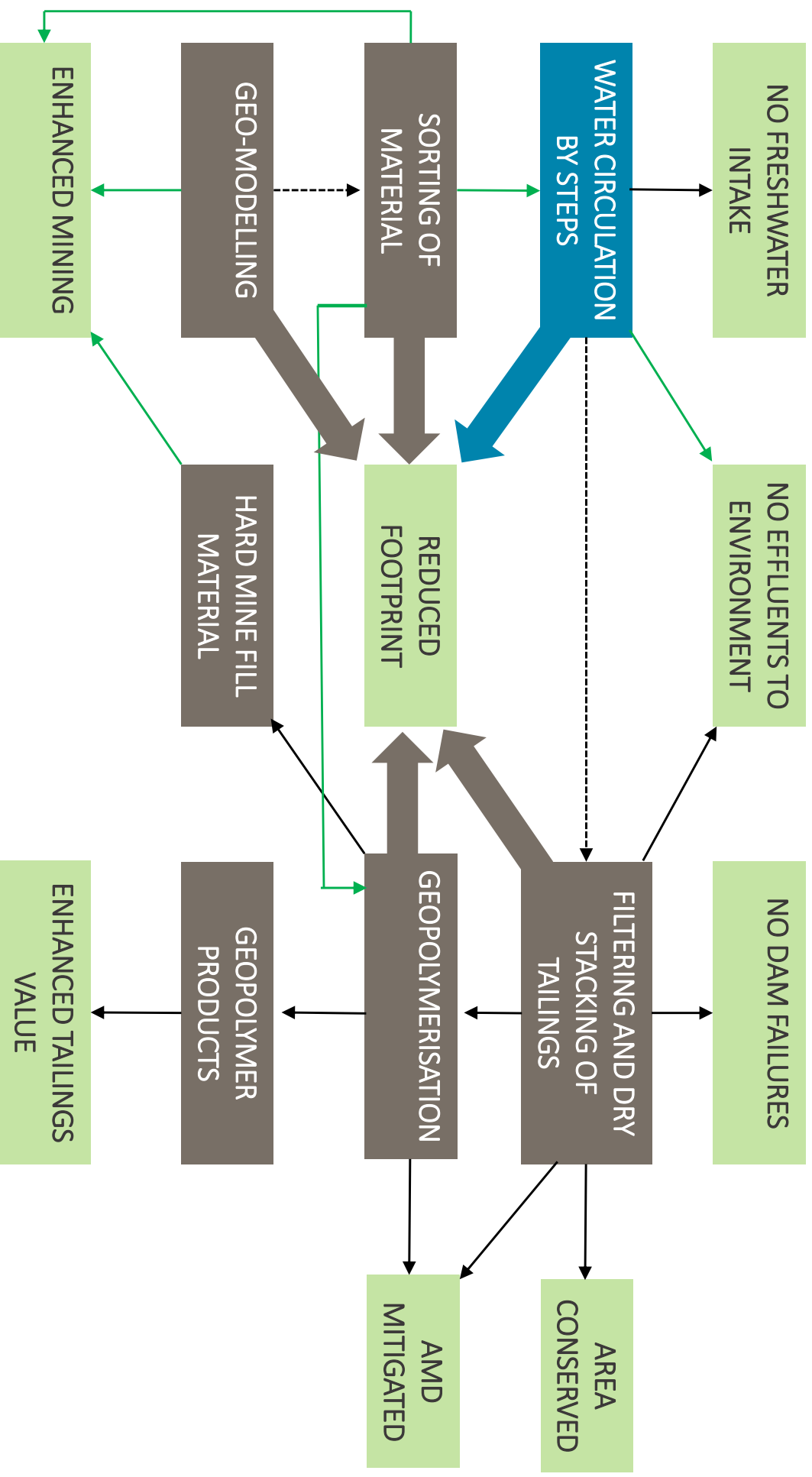
### TAILINGS VALORIZATION

- ✓ Geopolymerization for water and oxygen tight covers on deposited tailings
- ✓ Waste rock and tailings as hardening mine fill or sold as products
- ✓ All remaining tailings safely deposited as a filter dry cake

### MINIMIZATION OF ENVIRONMENTAL FOOTPRINT

- ✓ No effluents to environment
- ✓ No fresh water intake
- ✓ No dam failures
- ✓ Area conserved
- ✓ Enhanced mining
- ✓ Enhanced tailings value

# ITERAMS FRAMEWORK



NEEDS

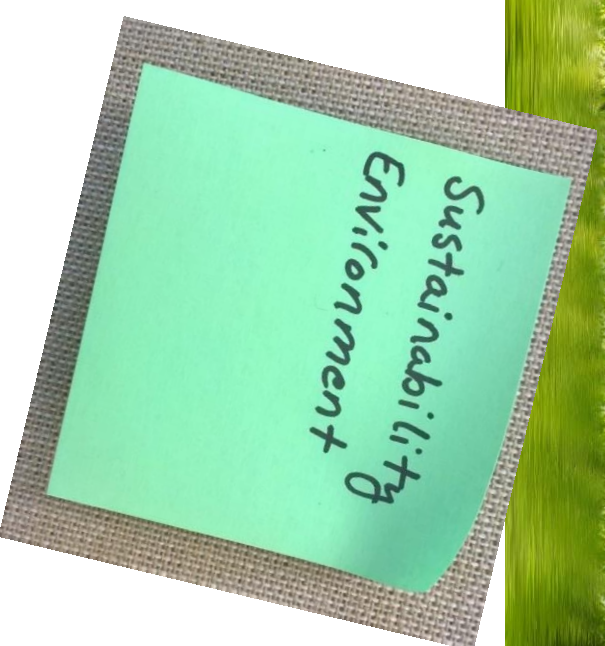
ENHANCES

MAKES POSSIBLE





- Development of test protocol for designing closed water loop systems
- Validation of ITERAMS water and waste efficient methods
  - At sites of the mining company partners Boliden (Finland), Somincor (Portugal) and Anglo American (Chile or South Africa)
- Demonstration of environmental footprint of the ITERAMS approach





Integrated mineral technologies for more sustainable raw material supply.

# REINVENTING THE ROLE OF WATER AND WASTE IN MINING

## THANK YOU!



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