



An initiative of the European Union

# CLUSTERS MEET REGIONS



A SUSTAINABLE APPROACH  
TO RAW MATERIALS

# KITTIILÄ

FINLAND | 25 · 27  
APRIL 2023

## EUCLUSTERS



## MATCHMAKING EVENTS

#SingleMarket30





# WELCOME BACK



# Agenda

**Session IV: Strengthening EU's critical raw materials capacities along all stages of the value chain: a coordinated effort**

**09:00 – 10:00 Inspirational talks**

**10:00 – 11:00 Debate** **To synergise regional, national and European policymaking to support responsible raw material utilization in Europe - recommendations**

**11:15 – 11:30 Conclusions and closing remarks**

**11:30 – 17:30 Site Vits**

**11:30– 13:00 Networking Lunch**

**13:30**

# Session IV: Strengthening EU's critical raw materials capacities along all stages of the value chain: a coordinated effort

**Facilitator: Benoît ESMANNE**, Policy Officer – Clusters and Industrial Forum, European Commission

## European Cases and Inspirational talks:

- **Santiago Cuesta López**, Executive Director, Iberian Sustainable Mining Cluster (ISMC)
- **Ilkka Nykänen**, Development manager, Business Joensuu - Outokumpu Mining Hub - intelligent waste rock and tailings management
- **Tuomas Nousiainen**, Horizon Results Platform



Debate - To synergise regional, national and European policymaking to support responsible raw-material utilisation in Europe – recommendations



**Dr., Dr.H.C. Santiago Cuesta-López**

General Manager ISMC-ICAMCyL



Depate - To synergise regional, national and European policymaking to support responsible raw-material utilisation in Europe – recommendations

# Ilkka Nykänen

Senior Adviser, Business Joensuu



# **Outokumpu Mining Hub - sustainable solutions for the mining industry**

Levi 27th April 2023

**Ilkka Nykänen**

Business Joensuu

# Background

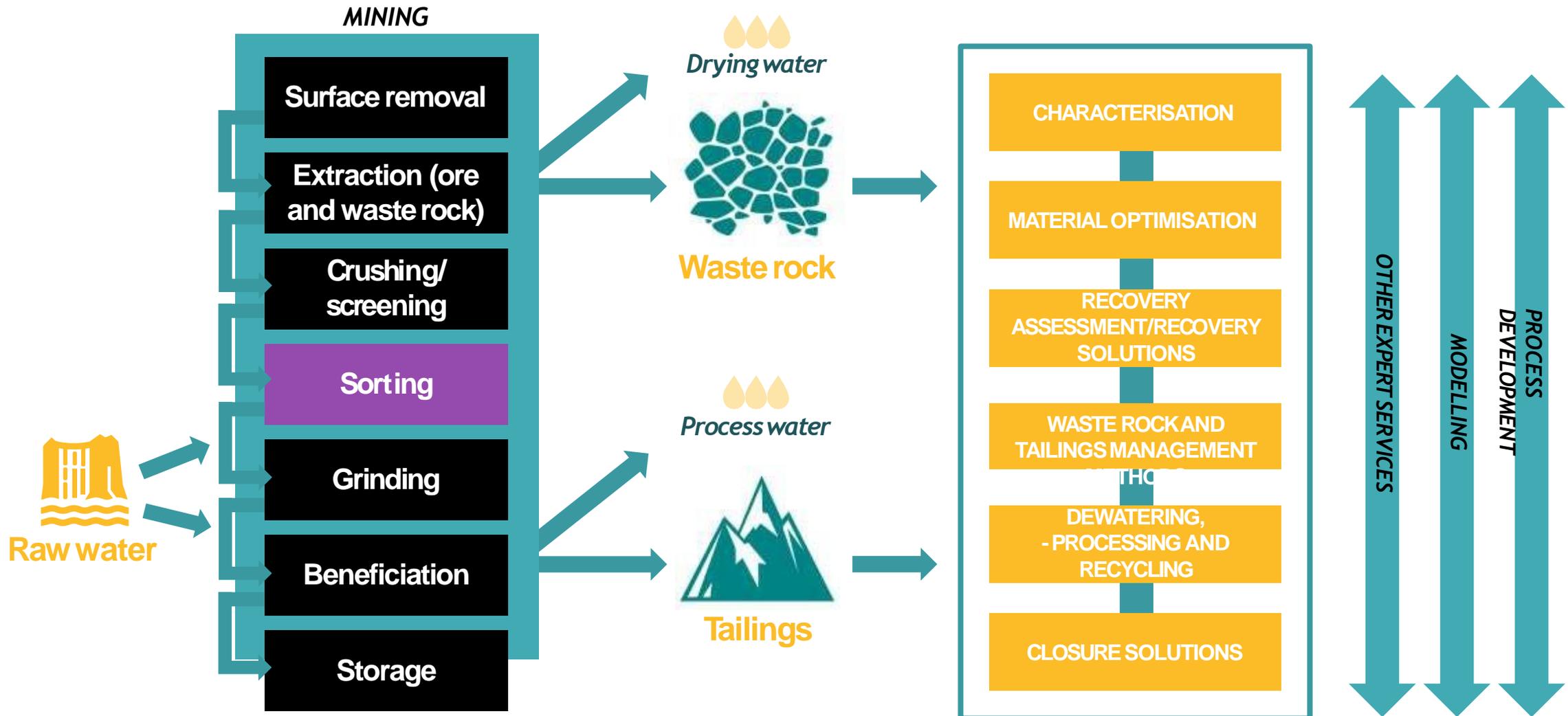
- **In 1930's** the modern Finnish mining industry was born in Outokumpu
  - Europe's biggest copper mine was located in Outokumpu
  - Valued technology company ,now calledMetso:Outotec was born
  - Roots for Mintec pilot plant was born
  - The town of Outokumpu grew around the mine
- **In 1980's** the mine run out starting a new era in Outokumpu
  - Outokumpu Industrial Parkwas born
  - Synertec SME cluster wasborn
- **In the last few years several development processes have been launched**
  - FinnCobalt mining prjobject
  - Mintec 2.0 investment 60-80 M€
  - Outokumpu Mining Hub-development

# What is the Outokumpu Mining Hub?

- Outokumpu Mining Hub is a public – private network (cluster), which will provide sustainable solutions for the most challenging future questions in the mining sector:
  - How to utilize the side rocks and the tailings better?
- What makes us capable in providing solutions for the mining industry in these quite complicated and demanding challenges?

## INTELLIGENT WASTE ROCK AND TAILINGS MANAGEMENT CORE ACTIVITIES

The value network consists of processes for the smart processing of waste rock and tailings that emphasise the thematics of modelling and reuse of materials



## 2 INTELLIGENT WASTE ROCK AND TAILINGS MANAGEMENT SERVICE OFFERING

A waste rock-oriented **service package** that could be produced in a value network together with partners

### MATERIAL CHARACTERISATION

#### Service offering

- Determining mineralogical and geochemical composition for the assessment of recovery and environmental impact

### FORECASTING LONG-TERM BEHAVIOR AND EMISSIONS

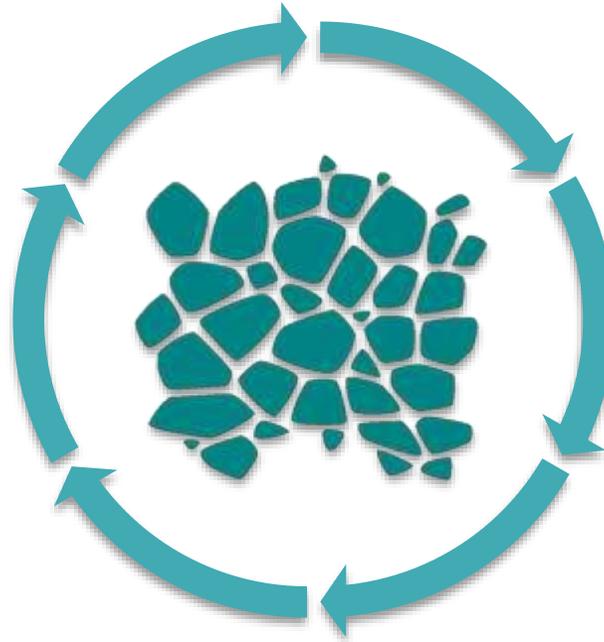
#### Service offering

- Forecasting the behaviour, emissions and environmental impacts of waste rock material on the basis of characterisation and modelling

### MANAGEMENT METHODS TO PREVENT ENVIRONMENTAL IMPACTS

#### Service offering

- Assessment, modelling and development of disposal solutions to minimise negative environmental impacts
- Placement of wasterock



### CLOSURE SOLUTIONS, TESTING AND SIMULATION

#### Service offering

- Simulation and testing of closure alternatives
- Environmental impact assessment
- Measurements related to construction

### WATER RECYCLING AND TREATMENT SOLUTIONS

#### Service offering

- Water entering structures
- Surface and leachate
- Environmental impact assessment

### ASSESSING THE USE OF WASTE ROCK

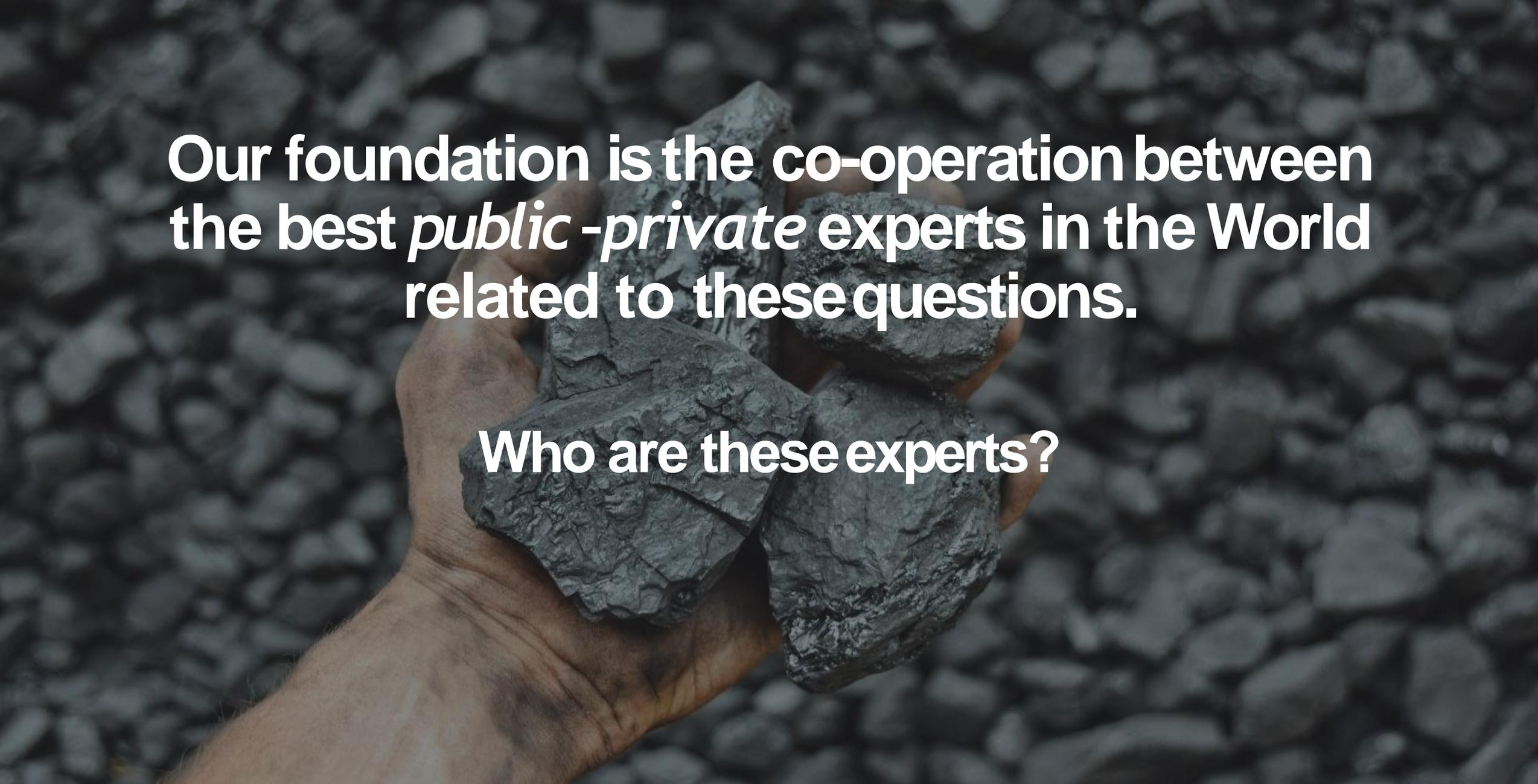
#### Service offering

- Waste rock material recovery assessment and productisation
- Development of separation techniques to exploit waste rock - material modification

### OTHER EXPERT SERVICES

#### Service offering

- Official statements
- Theme reviews
- Reports
- Process development of the entity



Our foundation is the co-operation between the best *public -private* experts in the World related to these questions.

Who are these experts?

**GTK Mintec**

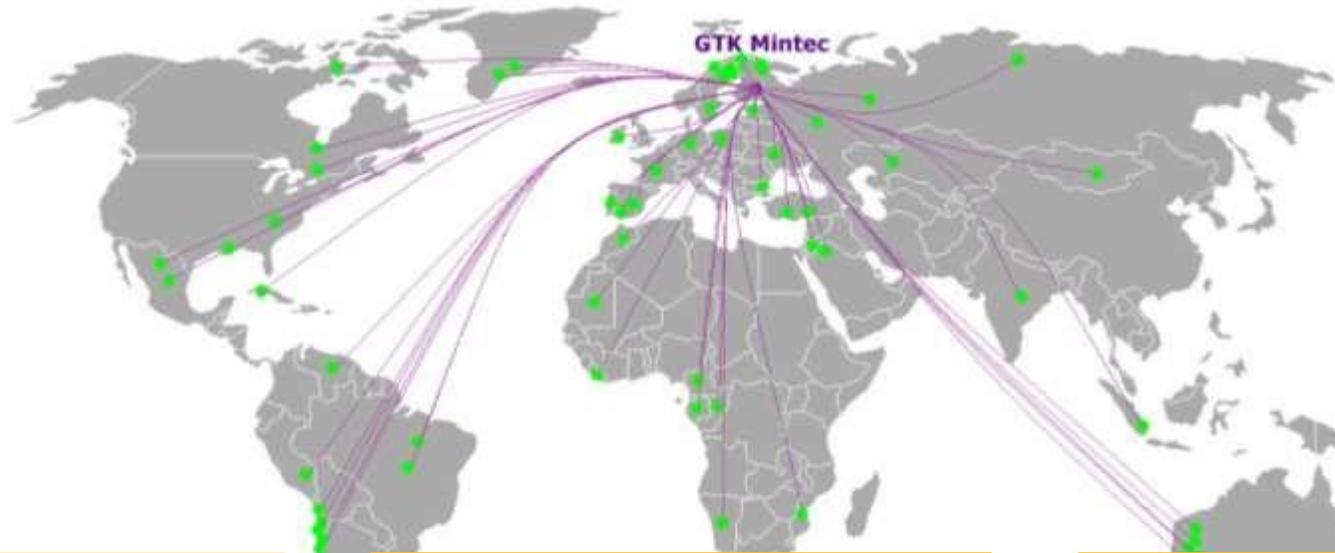
**Global Research and Innovation  
Platform for Mineral processing and  
Circular Economy**

# GTK Mintec – Internationally Unique Pilot Plant and Research Environment for Mineral Processing

- Founded in the 1980's.
- Mineralogical research, bench-scale processing laboratory and Pilot Plant
- Personnel around 50 persons.
- Unit totally: around 80-100 projects per year
- Customers mainly from mining, circular economy and metal industries.
- Pilot Plant contains crushing, grinding, beneficiation and tailings treatment as a continuous process
- Processing solutions for primary minerals, geomaterials, tailings, slags and other secondary raw materials
- Long experience of battery-minerals processing
  - Li, Ni, Graphite, Co



# GTK Mintec globally



## Customers

- 1988-2020: Totally around 2000 projects, out of which 300 pilot trials.

## International research networks

- [EIT Raw Materials](#)
- [Prometia](#)
- [Nordic Innovation](#)
- Etc.

## International collaboration

- Technology companies, Metso Outotec
- International consultants

# GTK Mintec 2.0



60-80 M€ investment in the next four years

1. Office and laboratory renewal

2. Pilot plant upgrade/renewal

3. Smart tailings facility (SMARTT)

4. Digitalization and automation

**The world's best digital pilot plant complex** for research and processing of circular and mining products, battery and industrial minerals and base metals.

# Other key players:

Private companies providing the best private solutions in a circular economy, working together with GTK Mintec and Business Joensuu.



Process  
Genius

Metso:Outotec



Way to green!  
FATEC

FINNCOBALT



**TAPOJÄRVÍ**





# Conclusion

- New businesses around Europe are welcome to join the Mining Hub innovation platform
- Joint investments will be in our focus
- The operational network of European Mining Hubs is our long term plan. It's been discussed among S3P Mining consortium.
- These operations are line with the European raw material policy and will support green transition and our common aim to strengthen European raw material self-sufficiency.



- Together we can create meaningful solutions for the future.

• **Thank you!**



**Ilkka Nykänen**

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# Session IV: Strengthening EU's critical raw materials capacities along all stages of the value chain: a coordinated effort

## Tuomas Nousiainen

### Horizon Results Platform





# EC Horizon Results Platform

## Valorising EU-funded research results

Clusters meet Regions East and North Finland - A sustainable approach to raw materials

25 to 27 April 2023

*DG RTD, Unit G.H.6 Common Knowledge and Data Management Centre*

*April 2023*

# Horizon Results Platform (HRP)

*Our raison d'être*



***"... A place where EU Research project results can flourish into innovations that contribute to our society and economy and to a sustainable future!"***

*– Mariya Gabriel, Commissioner for Innovation, Research, Culture, Education and Youth*

# Horizon Results Platform (HRP)

## An introduction

- The **Commission's corporate platform** promoting **Key Exploitable Results (KERs)**
  - Hosted on the F&T Portal
- **Programmes** on HRP to date:
  - Horizon 2020, FP7, **Horizon Europe\***, European Maritime & Fisheries Fund, Research for Coal & Steel, and the EIT-KICS
- **Key information per result:**
  - Target Audience / Needs / R&D maturity / Investor Readiness flags drive the match-making process / contribution to Horizon Europe Missions, ...
- HRP encompasses both the:
  - **Supply** side: beneficiaries' KERs, and
  - **Demand** side: industry, investors, policy makers, etc.



# HRP Valorisation Ecosystem

## Beneficiaries

Promote results and find partners

## Companies, Investors

Access to key input: maturity, UVP, needs, investor targets etc.

## Project & Policy Officers

Impact of HRP in the grantee lifecycle



## Events

Webinars, pitching events, networking events

## Synergies

Horizon Results Booster, IPR Helpdesk, investor communities

## Policy Outputs

Feedback to Policy, EU Mission result portfolios

# HRP Valorisation Ecosystem

HRP has created a unique ecosystem to accelerate beneficiaries' matchmaking and market uptake initiatives



European  
IP Helpdesk



## Benefits to results owners:

- **Tailored matchmaking opportunities**
  - Thematic pitching events
- **Demand-driven training** to accelerate uptake:
  - *IP management*
  - *How to pitch to investors*
  - *Investor readiness workshops*
  - One-to-one sessions with coaches or mentors
- **Access** investors and grow networks

## Benefits to users:

- Access to EU-funded **frontier technologies**
- Advanced search criteria allowing third parties to find **technologies** and innovative solutions **that best match their needs and interests**

# HRP Matchmaking Events

2019-2023



- **Over 15** matchmaking events organised on various topics
  - ❖ *Health, CleanTech, Blue Invest, Cancer, COVID Solutions, ...*
- **Over 75 companies and start-ups** pitched to investors and financial entities
- **Hundreds of beneficiaries** received tailored training and support from mentors and coaches
- **Access** to industry leaders, policy makers, investors and potential partners

# Horizon Results Platform TV

Inspiring beneficiaries and sharing best practices



Our videos provide additional support for D&E actions:

- **Educational interviews** with our partners offering their particular expertise:
  - IP management and using IP to valorise research results,
  - Approaching Business Angels and Venture Capitalists
  - Developing a business plan, ...
- **Inspirational testimonials** from project participants that have succeeded as entrepreneurs

## Business Planet Feature

BUSINESS PLANET

**Opportunities on the horizon: the platform promoting Europe's best innovation and research**

In partnership with The European Commission





# Searching R&I based technologies and solutions on HRP

Live demo

# Searching for results

NUTS2 coming!

**Filter by**

mining

Match whole words only

Country  
Select

Looking for  
Business partners - SMEs, Entrepreneurs, Large Corporations, I/we wish to transfer my/ou...

Advanced filters  
Current Stage of R&D / Commercial maturity x

Current Stage of R&D / Commercial maturity  
4 items selected

EU Missions  
Select EU Mission

Clear filters

**Project result search (7)**

FILTER(S): **Keyword:** mining **Looking for:** Business partners - SMEs, Entrepreneurs, Large Corporations **Looking for:** I/we wish to transfer my/our IPR to an interested party **Policy Area:** Business and industry

**Current Stage:** 4 - R&D Technology Demonstration (TRL 5-6) **Current Stage:** 5 - Demonstration - System Development (TRL 6-8) **Current Stage:** 6 - Demonstration - System Launch and Operations (TRL 8-9) **Current Stage:** 7 - Market Deployment

Sort by

**ZERO BRINE**

**PILOT PLANT**  
**Demineralised water plant**

**ZERO BRINE Technologies for recovery of valuable minerals from brines available**

ZERO BRINE - Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries

**We need**

- Business partners - SMEs, Entrepreneurs, Large Corporations
- Expanding to more markets /finding new customers

**21 contributors**

**Sectors**

- Business and industry
- Environment
- Research and innovation

**Result Maturity**  
5 - Demonstration - System Development (TRL 6-8)

**We have**

- ✓ IPR

**SUSTAINABLE DEVELOPMENT GOALS**

**6 CLEAN WATER AND SANITATION**

**9 INDUSTRY INNOVATION AND INFRASTRUCTURE**

Technology example:

# DISIRE 2020

- **DISIRE - Integrated Process Control Based on Distributed In-Situ Sensors Into Raw Materials and Energy Intense Processes** is introducing a three fold novel solution that it is consisting of:  
**a) inline sensors, b) industrial cloud based analytics, and c) Integrated Process Control cognitive reconfigurable schemes for adapting the optimal operation of industrial processes.**

This unique solution is aiming in fulfilling the gap in the industrial sector/industrial processes towards the need for a continuous and optimal operation of the processes that will optimize the production, minimize the energy consumption and the CO2 emissions.

DISIRE was inspired by the needs of multiple industrial sectors, including the non-ferrous, ferrous, chemical and steel sectors, aiming to evolve the existing industrial processes through an overall resource and energy efficiency paradigm, by developing miniaturised Process Analyzing technique (PAT) technologies capable of being inserted into flows of raw

- **TRL: 6-8**
- **Unique Value Proposition:**
  - Inline sensing technologies for industrial processes (product)
  - Online cloud based PAT analysis of industrial data (product and service)
  - Integrated Process Control reconfiguration for improving efficiency, reducing the overall cost and the corresponding CO2 emissions. (product and service)
  - Generalised architectures that can be directly applied and impact relevant industries
- **Looking for / needs:** Developing further our technology for a direct market insertion and creating the legal entity for continuing in the business sector.



Integrated Process Control Based on Distributed In-Situ Sensors Into Raw Materials and Energy Intense Processes

DISIRE - Integrated Process Control based on Distributed In-Situ Sensors into Raw Material and Energy Feedstock

**We need**

- To raise awareness and possibly influence policy
- Business partners - SMEs, Entrepreneurs, Large Corporations
- Incubators / Accelerators
- + more needs expressed

**9 contributors**

**Result Maturity**  
5 - Demonstration - System Development (TRL 6-8)

**We have**

- ✓ IPR
- ✓ Customers-on-Board
- ✓ Market study

**SUSTAINABLE DEVELOPMENT GOALS**

- 3 GOOD HEALTH AND WELL-BEING
- 8 DECENT WORK AND ECONOMIC GROWTH
- 13 CLIMATE ACTION



Policy eample:

# International Raw Materials Observatory

- [The International Raw Materials Observatory](#) is a not for profit international association, created to support worldwide cooperation on mineral raw materials' research & innovation, education & outreach, industry & trade and recycling, management & substitution of strategic raw materials.

The project has mapped best practices on mineral raw materials policies in five reference countries (Australia, Canada, Japan, South Africa and the USA), and advanced a roadmap to foster the EU response to global challenges on mineral raw materials supply. Mineral raw materials' data collected by the Observatory are managed, curated, and preserved in an open repository accessible through the Observatory website. The Observatory disseminates for free, since 2018, specialised information using three vehicles: 1) the world barometer; 2) thematic factsheets; and 3) matchmaking events.

- **Influence on policy making:**

The set of values of the International Raw Materials Observatory is built around the concept of honest broker, acting as an impartial international mediator specialised in the minerals value chain to support international cooperation and exchange of best practice. To ensure its independence, the Observatory combines an offer of exclusive services to members with an offer of services to the marketplace.

- Reports and factsheets: on mineral raw materials
- Foresight studies: on sector trends
- World barometer: providing members with periodic reports on opportunities and threats relating to mineral raw materials provision

- **Looking for / needs:** Subscription Membership from organisations and companies interested in the mineral raw materials industries.



International Raw Materials Observatory

INTRAW - International cooperation on Raw materials

- 🏠 We need
  - To raise awareness and possibly influence policy
  - Grants and Subsidies
  - Other blended financing
  - + more needs expressed
- 👥 16 contributors
- 📁 Sectors
  - Business and industry
  - Education and training
  - Environment
- 📊 Result Maturity
  - 7 - Market Deployment
- 📁 We have
  - ✓ Customers-on-Board
  - ✓ Investors-on-Board

**SUSTAINABLE DEVELOPMENT GOALS**

- 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
- 12 RESPONSIBLE CONSUMPTION AND PRODUCTION
- 17 PARTNERSHIPS FOR THE GOALS



Thank you,  
we look forward to hearing from you!

Horizon Results Platform Team

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 [www.clustercollaboration.eu](http://www.clustercollaboration.eu)



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