

A photograph of a mining site. In the background, a large, rugged rock face is visible. In the middle ground, four workers wearing high-visibility yellow safety suits and white helmets are walking across a gravelly area. Their reflections are visible in a pool of water in the foreground. The text 'MINING FINLAND' is overlaid in large white letters, and 'Technologies, services and education export from Finland' is overlaid in smaller white letters below it.

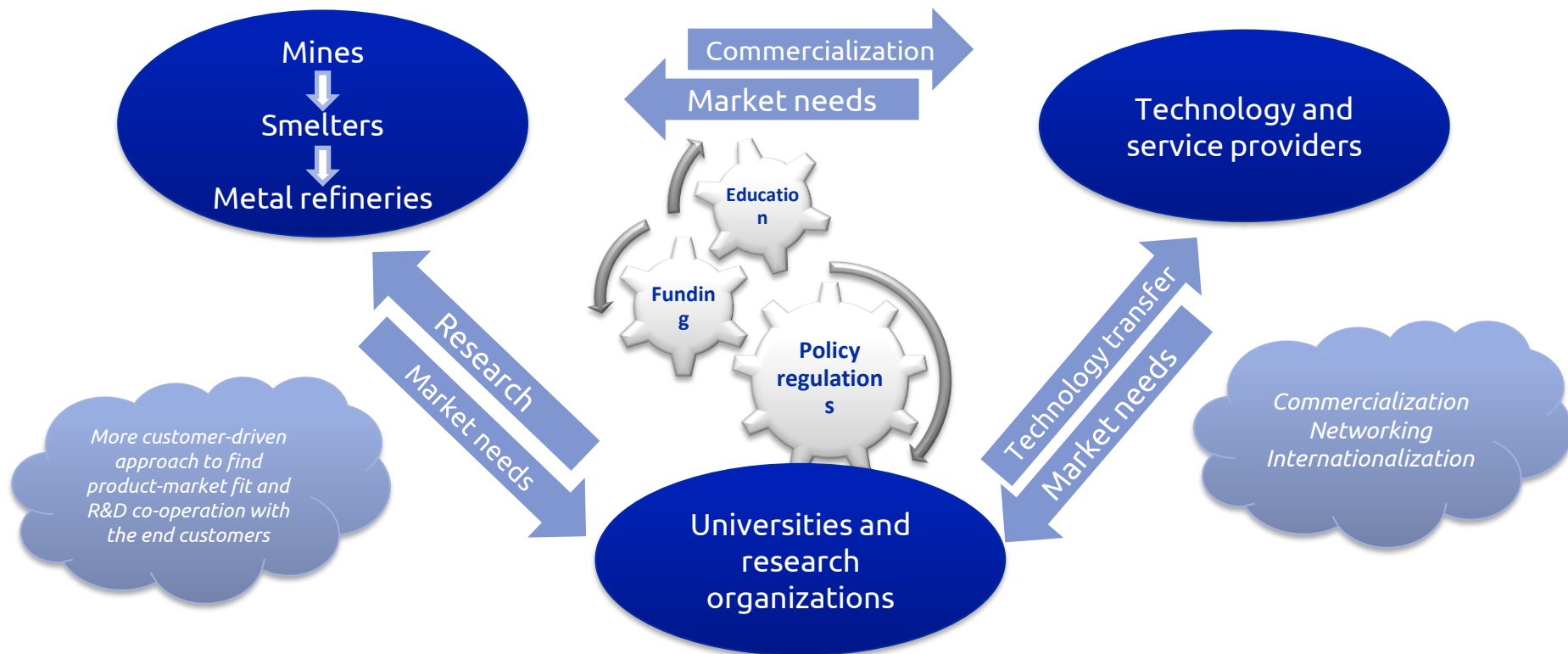
MINING FINLAND

Technologies, services and education export from Finland

Finland has a strong mining ecosystem



SUOMI
FINLAND





Mining Finland - Contact point for you

SUOMI
FINLAND

- Promotes mining technology and services
- Facilitates R&D and education collaboration
- Fosters foreign investments to the Finnish mining cluster

**Non-profit association
funded by members**

Members:

- Startups and large companies
- Private technology and service companies
- Junior mining companies
- Universities and research organizations
- Regional development companies

Ecosystem examples

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FINLAND



Exploration ecosystem

- Airborne and ground geophysical, geochemical surveys
- Sampling
- Logging
- 3D modelling
- Data processing
- Drilling services
- Drilling equipment
- Mobile scanning laboratory

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- GTK
 - Rock Physics Finland
 - ADC
 - Radai
 - Comadev
 - Geopyörä
 - Ima Engineering
 - Lumo Analytics
 - Robit
 - Geoukko



Smart mining ecosystem

- Connectivity
- Autonomous load and hauling
- Big data
- AI
- Predictive maintenance
- Realtime performance monitoring
- Realtime decision making
- Automation

Digital twin

- Metso
- Sandvik
- Nokia
- Ima Engineering
- Millisecond
- Normet
- Fincet
- Rovjok
- Callio
- CEMIS



Mining & Mineral processing ecosystem

- Drilling, charging
- Blasting, crushing
- rock support, rock mechanics
- Size reduction and separation
- Concentration
- Enrichment
- Dewatering
- Online monitoring

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- Metso
 - Metabar
 - Sandvik
 - Normet
 - ABB
 - University of Oulu
 - BioSO4
 - Valmet
 - Merus Power
 - Magsort
 - KPEDU
 - New Paakkola



Water treatment ecosystem

- Waste rock management,
- Tailings management
- Water treatment
- Water balance
- Online monitoring
- Emission control

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- Metso
 - Valmet
 - EPSE
 - RF Valves
 - Watman
 - Owatec
 - Hycamite
 - Savonia
 - 3AWater
 - Watermaster
 - Kemira
 - Mittausguru



Mine Closer ecosystem

- Site rehabilitation
- After care

-
- GTK
 - VTT
 - Merus Power
 - Feasib
 - Betolar
 - Biobros
 - EPSE
 - Elmyr
 - PEAB
 - Mitta
 - Sitowise
 - Oinride



161 members of Mining Finland

- Entire mining value and supply chain
- Startups and large companies
- Private technology and service companies
- Junior mining companies
- Universities and research organizations
- Regional development companies

16.4.2025





Circular solutions



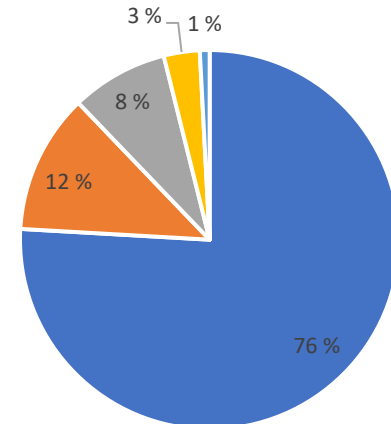
Mining industry has a leading role

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FINLAND**

- Close on 116 million tonnes of waste generated in Finland in 2020
- Share of mining and quarrying: 76% of total tonnes
- Huge potential for new raw materials recovering

Waste in Finland

- Mining and quarrying
- Construction
- Other industries
- Services and households
- Electricity, gas etc.





Environmental and economic motivation

- New raw material opportunities for mining companies
- Intelligent process equals to money
- Reduced consumption of natural resources
- Minimized energy consumption





Circular solutions for entire life cycle

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Process water	Energy	Side streams	Metals
<ul style="list-style-type: none">• 90% into circulation	<ul style="list-style-type: none">• Recovery of excess energy	<ul style="list-style-type: none">• Raw materials for cement and concrete production	<ul style="list-style-type: none">• Sustainable circulation• Up to 90% of materials used in steel production are recycled



Innovators in the mine



Cosmetics from tailings

- Otanmäki Mine Oy
- Acquired 10 million tonnes of tailings from closed mining
- Recovers ilmenite for titanium dioxide producers
- TiO_2 used in paint and cosmetics industry

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The end of Waste

- Tapojärvi Oy
- Separates recoverable materials from steelworks slag
- End of Waste status in Italy





Valuable minerals from water

- Weeefiner Oy : recovers dissolved raw materials from mine waters
- Owatec Oy: Separates valuable components from process water
- Epse Oy: Metals from slag and process water back into the process

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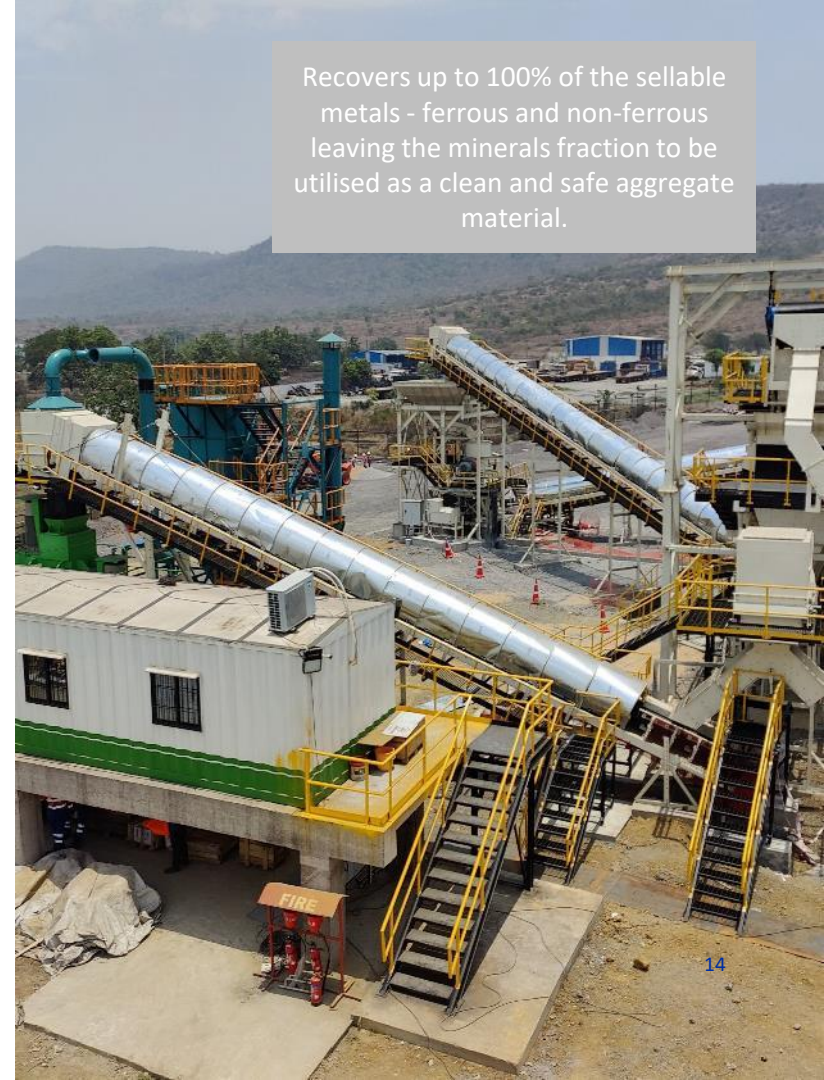


Weeefiner recovers irreplaceable raw materials and turns waste streams into sustainable and business



Minerals recovered from slag

- Magsort Oy
- Recovers all the metal in slag and turns it into valuable sellable commodities





Finnish Way – all together



Challenges we continue to tackle

- Side stones far from urban construction
- New innovators needed to develop circular solutions
- More sources to fund new solutions and business models
- More public-private R&D to support innovations





Work together to find solutions

Companies, research institutes and the government share the same goal:

- More than ten mining related universities and research organizations
- Over 200 mining technology and service providers
- Over 40 mines
- Ten smelters and steel mills





Contact us

Lasse.Moilanen@miningfinland.com

www.miningfinland.com

LinkedIn: Mining Finland



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