

WORLD MATERIALS FORUM · PARIS 2026

AI in Mining, Processing & the Battery Value Chain

Matti Hietanen, CEO, Finnish Minerals Group | 4 September 2026

Our Portfolio at a Glance

Powering European energy and security with strategic minerals



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Terrafame

Battery-grade
nickel and cobalt sulphates,
zinc, uranium & copper
(scandium near term future)

Europe's largest nickel
reserve and one of the
world's largest vertically
integrated battery
chemicals production
facilities with industry-
leading sustainability
performance.

56%

FMG Ownership



Sotkamo, Finland

we are one
**Sibanye
Stillwater**
KELIBER

Battery-grade
lithium hydroxide

An integrated lithium
mining and refining project
positioned to become
Europe's first producer of
battery-grade lithium
hydroxide from its own ore
resources.

20%

FMG Ownership



Kokkola, Finland

SOKLI

Phosphate and rare
earth elements potential

A globally unique
carbonatite deposit with
significant phosphate and
rare earth elements (REE)
potential, supporting
Europe's future supply of
critical raw materials and
fertilizers.

100%

FMG Ownership



Savukoski, Finland

 **EASPRING
FINLAND**

Cathode active materials

A state-of-the-art cathode
active material (CAM) plant
in Kotka, producing
cathode active materials
for electric vehicle
batteries.

28%

FMG Ownership



Kotka, Finland

IONCOR

Battery systems
and battery packs

A provider of high-density
modular battery systems,
delivering battery packs
and electrification
solutions for electric
mobility and industrial
applications.

70%

FMG Ownership



Salo, Finland
Uusikaupunki, Finland
Kirchardt, Germany

+ Case 1: AI used in operator training



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“A trained operator on day one.”

Digital twin turns a new plant into a familiar one before the first tonne is made.



Europe's first fully integrated lithium producer

15ktpa battery-grade LiOH – unique case for operation in the EU.



Geminex digital twin trains the crew before start-up

Rehearse start-ups, upsets and grade changes virtually.



Safe, low-risk ramp-up

Shorter learning curve; de-risked commissioning.

Cutting downtime to minimum can yield €10m-€20m savings annually



KELIBER · Kokkola LiOH plant & laboratory

+ Case 2: Permitting – the problem



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Over-reliance on the precautionary principle

A permit can be refused even where there is no evidence an impact would ever occur.



The burden of proof is reversed

Applicants must prove a negative – absence of evidence is not accepted as evidence of absence.



Water is the critical parameter

Long-term effects on groundwater and watercourses are the hardest to exclude.



Timelines are long

Mining permit processes can run for several years, delaying investment, jobs and value.

+ Case 2: Permitting – how AI can help



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TWO WAYS AI HELPS



Model impacts to the standard the principle demands

Physics-based AI/ML digital twins of groundwater, geochemistry and hydrology simulate long-term behaviour and quantify residual uncertainty.



Automate and accelerate the process

Completeness checks, precedent retrieval, comment analysis and drafting – compressing multi-year timelines.



Turn doubt into defensible evidence

“We cannot exclude it” becomes a probabilistic, evidence-based case.

SAVINGS POTENTIAL

~2 years reduction of
permitting time



€10m – €100m

*economic impact, depending on
investment stage*



The critical parameter: water

AI-grade modelling can quantify long-term impacts on groundwater and watercourses – the evidence permitting demands.

- **West Casino, AU:** Gaussian-process emulators reproduced thousands of groundwater runs, quantifying drawdown risk.
- **Chile SEA, Dec 2025:** AI tools search 27M+ pages across 29,000+ projects – a model for Finland.

Terrafame site at Sotkamo, Finland



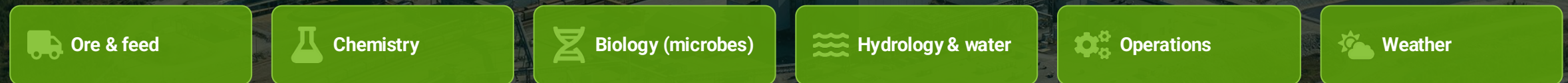
Case 3: Terrafame — modelling a bioleaching process

PROCESS STAGES



Economic benefit: AI optimisation can bring efficiency gains worth billions of € over 10–20 years.

INTERACTING VARIABLES DRIVING HEAP PERFORMANCE



Responses range from real-time to multi-month — heap dynamics still need to be explained; advanced computing and AI are a promising route.

Terrafame Global Innovation Challenge

AI for Bioleaching

8-month

open innovation program

5–10

finalists to the Grand Final

€ Paid

collaboration for the winner

Global

start-ups, scale-ups & industrial teams

OCT 2026
Challenge Open

NOV 2026
Global applications

DEC 2026
Shortlist of finalists

JAN–MAR 2027
8-week build

MAR–APR 2027
Grand Final · Sotkamo

+ Conclusion: AI as a competitive edge across the value chain



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Operator training

Digital twins train Keliber's crew before start-up, de-risking a lithium hydroxide plant.



Permitting

At Sokli, AI-grade environmental modelling helps satisfy the precautionary principle; automation cuts multi-year timelines.



Process improvement

Terrafame's Global Innovation Challenge employs AI to model a system too complex for conventional tools.

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