

MINERAL RECYCLING **FORUM** 2022

Hilton Imperial Dubrovnik, 28-30 March 2022

SUMMARY SLIDE DECK

Secondary raw material sources, supply, processing, and markets



The networking and knowledge hub for the industrial mineral recycling business

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INFORMED MINERAL RECYCLING FORUM 2022

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MK Recycling GmbH

Thank you Ismene and Mike! This was a wonderful restart after two years of pandemic with trendsetting topics in this stunning setting.

Bettina Horn, Consultant, Germany

I'd like to compliment you with this successful conference. I was pleasantly surprised with the quality of speakers, as well as the attendance.

Alex Medendorp, Sales & Marketing Director, Nedmag, Netherlands

Excellent talks and great venue, well organised.

Nancy Easterbrook, Director Recycled Minerals, HarbisonWalker International, USA

Lots of information. Excellent, best one yet.

Mark Connor, Director, Richmond Reclamation, UK

Very interesting programme and speakers. Excellent venue.

Àlvaro Manuel Rodríguez, Logistics, Purchasing & Planning Manager, Pasek, Spain

Well organised, excellent programme. A huge networking opportunity and awareness of challenges and market trends.

Shirshah Amerkhail, Sustainability Advisor, IMA-Europe, Belgium

PROGRAMME

TUESDAY 29 MARCH

OVERVIEW

09.00 Welcome & Introduction

Mike O'Driscoll & Ismene Clarke, Directors, INFORMED, UK

09.30 Industrial minerals and recycling concepts and technology for the industry

Frédéric Jouffret, Imerys VP Innovation, & Chairman
Imerys Talc Europe, France

10.00 COFFEE BREAK

MINERAL FLOWS | BRINES

11.00 Optimisation of mineral flows: matching the policy and business perspectives

Shirshah Amerkhail, Sustainability Advisor, IMA-Europe, Belgium

11.30 Brine recycling: Salts Plus

Stefan Schlag, Director Inorganic Chemicals & Minerals,
S&P Global Commodity Insights, Switzerland

12.00 LUNCH

PROGRAMME

LITHIUM BATTERIES | BAUXITE

Video

- 14.00 **Li-ion battery market and its mineral recycling future**
Robert Colbourn, Publisher, Benchmark Mineral Intelligence, UK
- 14.30 **Bauxite tailings valorisation: From test works to industrial scale up**
Thomas Baumann, Engineer Sales & Business Development,
AKW Apparate + Verfahren GmbH, Germany

15.00 COFFEE BREAK

SLAG | METALLURGICAL WASTE

Video

- 15.30 **Challenges for the slag value chain in Europe**
Thomas Reiche, Chairman, Euroslag, & Managing Director,
FEhS-Institut für Baustoff-Forschung eV, Germany
- 16.00 **Combined mining & metallurgical know-how – insights into recycling of metallurgical slags, bricks & dust**
Dr Jan Lampke, Head of Sales & Projects,
Haver Engineering GmbH, Germany

16.30 **CLOSE OF DAY 1:**
NETWORKING DRINKS, BALLROOM PRE-FUNCTION AREA



PROGRAMME

WEDNESDAY 30 MARCH

REFRACTORIES 1

- 09.00 **Introduction**
Mike O'Driscoll, Director, INFORMED
- 09.15 **Sustainable refractory concepts**
Dr Helge Jansen, Managing Director, Refratechnik Steel, Germany
- 09.45 **Recycling refractories: developments & outlook**
Sabrina Salmen, Senior Executive Recycling, RHI Magnesita, Netherlands

10.15 COFFEE BREAK

REFRACTORIES 2

- 11.15 **Recycling ceramics: new approaches to respond to the growing demand**
Bruno Dorier, Director, Valoref Saint-Gobain, France
- 11.45 **A circular economy solution in the field of steelmaking waste: ReStoRe technology**
Massimo Proietti, Technical Director, Deref SpA, Italy

12.15 LUNCH & CLOSE OF FORUM

New era of mineral exploration, sourcing, development **+ RECYCLING**

- Inevitable development spotlighted
& advanced by pandemic/Ukraine conflict
 - = Mineral sourcing strategy rethink
 - = Accelerated mineral recycling



New era of mineral recycling

Primary drivers: “Rule of Six”

1. **Limited primary sources:** shortage of commercially developed “critical” mineral resources and processing plants
2. **Source overreliance:** risky overreliance on supply/trade from limited overseas source
3. **China in change:** supply issues, range of factors.
4. **Emergence of hi-tech growth markets:** to become mainstream, particularly in the energy sector (eg. Li-ion batteries, EVs, solar, wind), and thus demand for respective critical minerals (eg. lithium, graphite, rare earths).
5. **Environment:** saving the environment, drive for the “Circular Economy” gathering momentum
6. **Recycling technology more economic/established:** from esoteric, expensive sideshow, to mainstream processing line; opportunities sensed and sought after



New era of mineral recycling

Outlook: Accelerated mineral recycling by primary mineral producers

- More **miners** involved in recycling tailings and other waste sources to offer wider product range (including blends?) with a favourable “green” label on portfolio, *eg. announced in 2020-22:*

Nordkalk, Finland

LKAB, Sweden

Hindalco, India

Noranda Alumina, USA

Rio Tinto, Canada

Nutrien/Arkema, USA

new process for recovering wollastonite from tailings in Lappeenranta

new strategy US\$1.2-2.4bn over 15-20yrs: incl. CM from mine waste

REE, fluorspar, gypsum, phosphorus from iron ore tailings

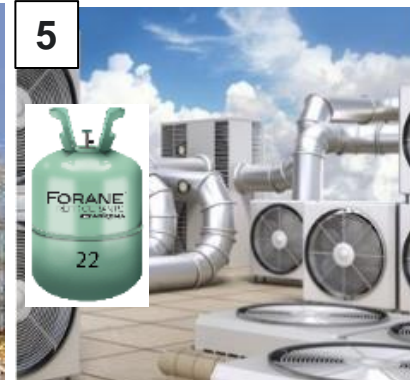
to supply 1.2m tpa bauxite residue to UltraTech Cement

to supply 60k tpa bauxite residue to CemTech Materials

scandium oxide from ilmenite processing waste

Nutrien to supply 40k tpa anhydrous HF from phosphate rock processing

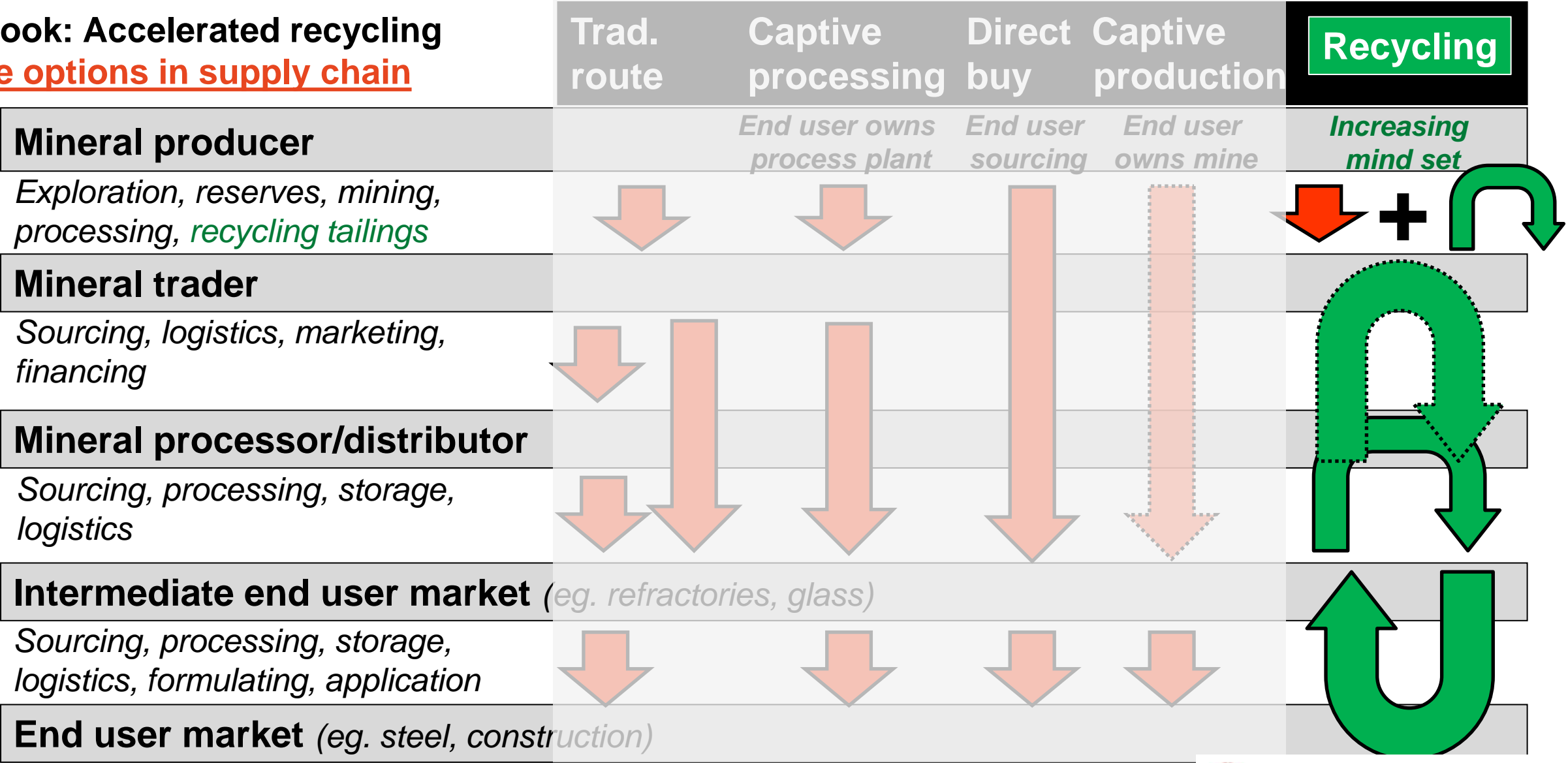
FSA waste to Arkema (replacing fluorspar imports)



Nutrien's huge Aurora, NC phosphate mine (1) produced 4.3m tonnes phosrock in 2019, supplying its processing complex (2) (prod. cap. 5.4m tpa phos. concentrate, 1.2m tpa phos acid, and 0.8m tpa DAP/MAP). By 2022 a new 40,000 tpa FSA-to-AHF plant will be installed (may look like 3) to supply Arkema's Calvert City, KY plant (4), producing fluoropolymers and fluorochemicals (5), replacing an equivalent approx. 88,000 tpa acid grade fluorspar input.

New era of mineral recycling

Outlook: Accelerated recycling
More options in supply chain



New era of mineral recycling

Outlook: Accelerated mineral recycling

- **Drivers:**

- alternative mineral source
- cutting costs (from waste disposal)
- move to develop Circular Economy to protect environment
- **provides mineral suppliers and mineral consumers with “green” portfolio**

- **“New normal”:** Recycled raw materials will become a “normal” supply chain option for mineral buyers

- **Challenges remain:**

eg. competitive pricing; grade quality; advanced sorting techniques; development & investment processing tech.; harmonisation of waste handling/permitting; “education” of industry and ridding of stigma of recycled material as “contaminated” and “secondary”

- **Government input:** Critical Mineral policies; recycling initiatives

eg. Feb. 2022: US Dep. of Energy \$6bn grant for batteries; 50% earmarked domestic supply + recycling.

- **Opportunities** to process minerals from waste, develop & supply sorting technology & equipment

- **Economic alliances** increasing between waste sources (end users) + recyclers, new logistic chains

- **Supply chain co-operation** in modifying end product formulations to ease end-of-life recyclability



Red mud from bauxite processing subject to much R&D in recycling



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Sponsorship/Exhibit/Registration Enquiries

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Programme/Speaker Enquiries

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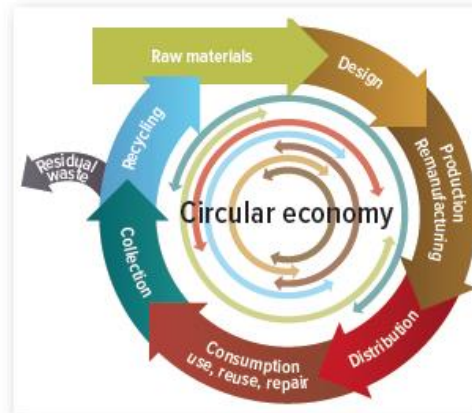


- **Launched in January 2015**
- **Extensive experience & reputation**
- **Specialising in conferences & market research in:**
 - **Industrial Minerals Supply/Demand**
 - **Magnesia**
 - **Refractory Minerals**
 - **China**
 - **Mineral Recycling**
 - **Fluorine**
 - **India**
 - **Oilfield Minerals**
 - **Salt**

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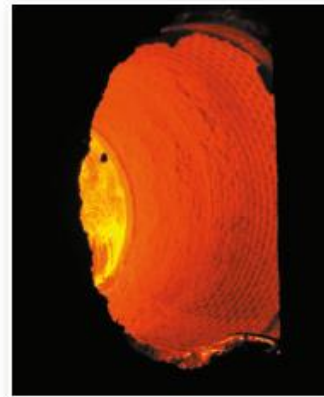
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MAGFORUM2023

Magnesium Minerals & Markets Conference

30 May-1 June 2023, Grand Hotel Dino,
Baveno, Lake Maggiore (Milan)



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