

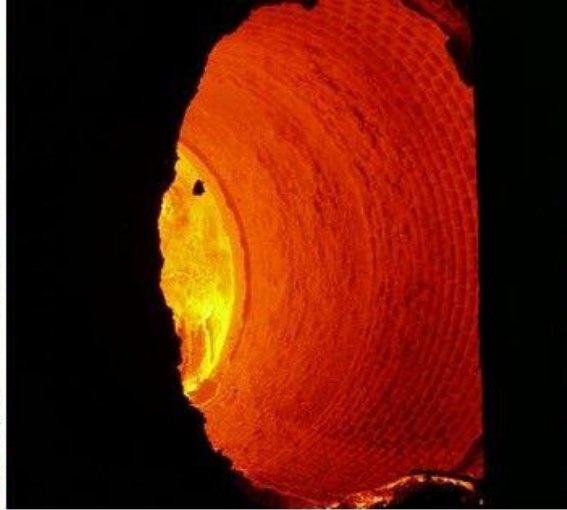
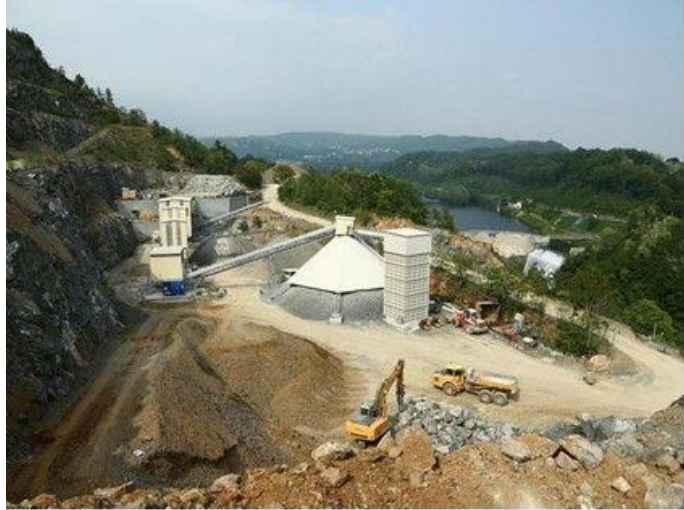
SUMMARY SLIDE DECK

MAGFORUM 2023



Magnesium Minerals & Markets Conference

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



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Sponsors



Field Trip Host



Exhibitors



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MAGFORUM 2024



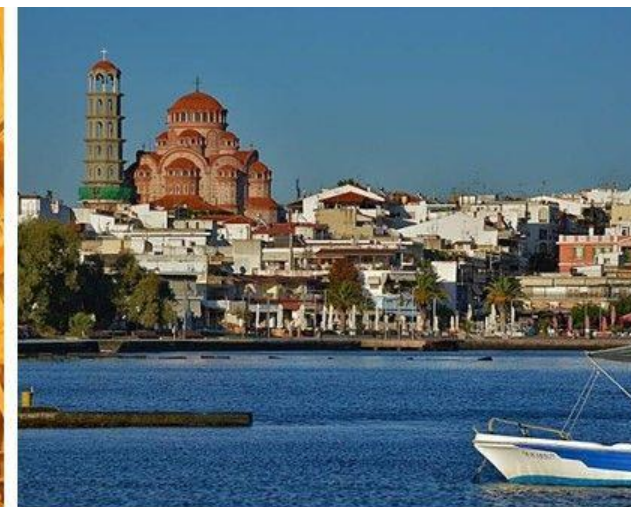
Magnesium Minerals & Markets Conference

The Pomegranate Wellness Spa Hotel, Halkidiki — 13-15 May 2024

Lead Sponsor & Field Trip Host



Field Trip to Grecian Magnesite, Yerakini, Thurs. 16 May



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Lead Sponsor: Welcome Reception & Finale Lunch



RHI MAGNESITA

Day 1 Reception



Day 1 Lunch



Field Trip Host

EXHIBITORS



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Verde Magnesium
Vesuvius
Xihua Group Co Limited
Xilolite
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Zaklady Magnezytowe Ropczyce

MAGFORUM 2023

Magnesium Minerals & Markets Conference

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



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Industrial Mineral Forums & Research

Visiting the olivine mine of Nuova Cives was one of the highlights. This annual event brings together the best in the magnesite industry. It was fantastic to catch up with our long time partners and also have the chance to connect with new customers and suppliers.

Niklas Lüdemann, Head of Region North America, CREMER ERZKONTOR, USA

Excellent programme and venue. The market outlook presentations and Roundtables were great.

Altug Cakmur, CFO, Turkmag, Turkey

It has been a great experience getting to connect with my colleagues from around the world at MagForum! It's a pleasure to catch up with our customers and getting more insights to the global magnesia market. Looking forward to next year!

David Torres, Global Marketing Manager Minerals, RHI Magnesita, USA

Very informative and interactive, and good networking opportunities. Excellent attention to small details in organisation.

Supravo Kundu, Global Category Manager, Calders Deutschland, Germany

Wonderful venue. The Roundtable discussions were quite helpful and a highlight of the programme. I had not attended MagForum for several years, and was immediately reminded how helpful it is.

Dave Martin, Industrial Business Director, Premier Magnesia, USA

Valuable takeaways, being well informed, really good networking, excellent organisation.

Elena Martinez, Lead Buyer of Chemicals, Lincoln Electric, USA

Congrats on putting on an absolutely stellar conference! Honestly one of the best I have ever been to.

Alex Grant, Chief Executive Officer, Magrathea Metals, USA

Excellent programme, good mix of themes, superb venue.

Asier Gastaminza, Sales Manager, Midegasa, Spain

Garrison Minerals was proud to attend MagForum2023, hosted by IMFORMED in beautiful Baveno, Italy. This great event provides Garrison Minerals with valuable network opportunities and global magnesia market insights.

Garrison Minerals, USA

Excellent venue to meet and greet, with a decent set of speakers.

Alex Medendorp, Sales & Marketing Director, Nedmag, the Netherlands

MAGFORUM

SOURCE



**The world of magnesia
A world of diversity**



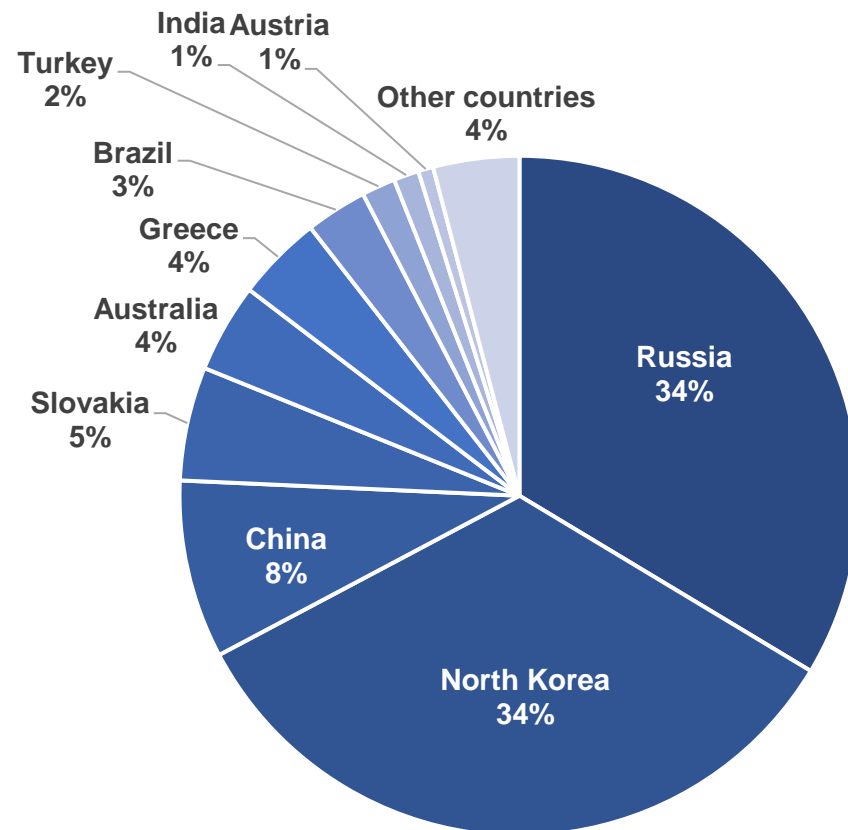
GRADE

MARKET

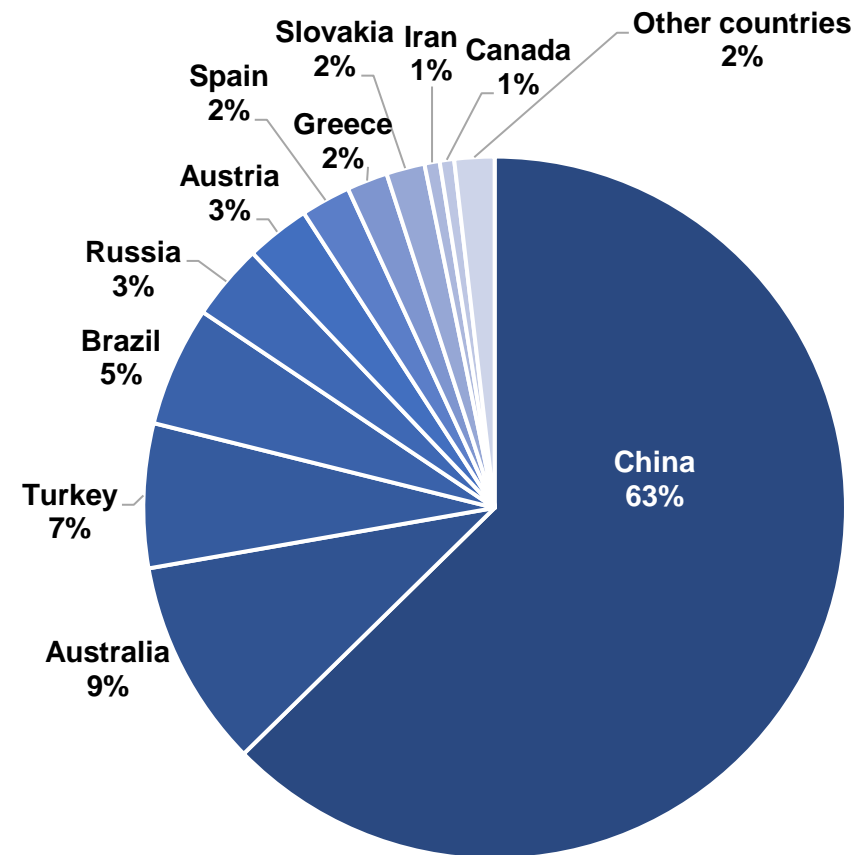
Magnesia overview

World magnesite supply

World magnesite reserves 2022
6.8bn. tonnes estimated



World magnesite production 2022
27m. tonnes estimated



Source: data from USGS 2023

Magnesia overview

Mineral diversity

Other natural MgO minerals

Bischofite	$\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$
Carnallite	$\text{KMgCl}_3 \cdot 6\text{H}_2\text{O}$
Kieserite	$\text{MgSO}_4 \cdot \text{H}_2\text{O}$
Dolomite	$\text{CaCO}_3 \cdot \text{MgCO}_3$
Brucite	$\text{Mg}(\text{OH})_2$
Huntite	$\text{Mg}_3\text{Ca}(\text{CO}_3)_4$
Hydromagnesite	$\text{Mg}_4(\text{OH})_2(\text{CO}_3) \cdot 4\text{H}_2\text{O}$
Serpentinite	$(\text{Mg}, \text{Fe})_3\text{Si}_2\text{O}_5(\text{OH})_4$
Olivine	Mg_2SiO_4
Dunite	>90% olivine
Nesquehonite	$\text{MgCO}_3 \cdot 3\text{H}_2\text{O}$
Periclase	MgO



Sibelco's huntite-hydromagnesite mine in Kozani, Greece



Nuova Cives' olivine mine, Vidracco, Italy

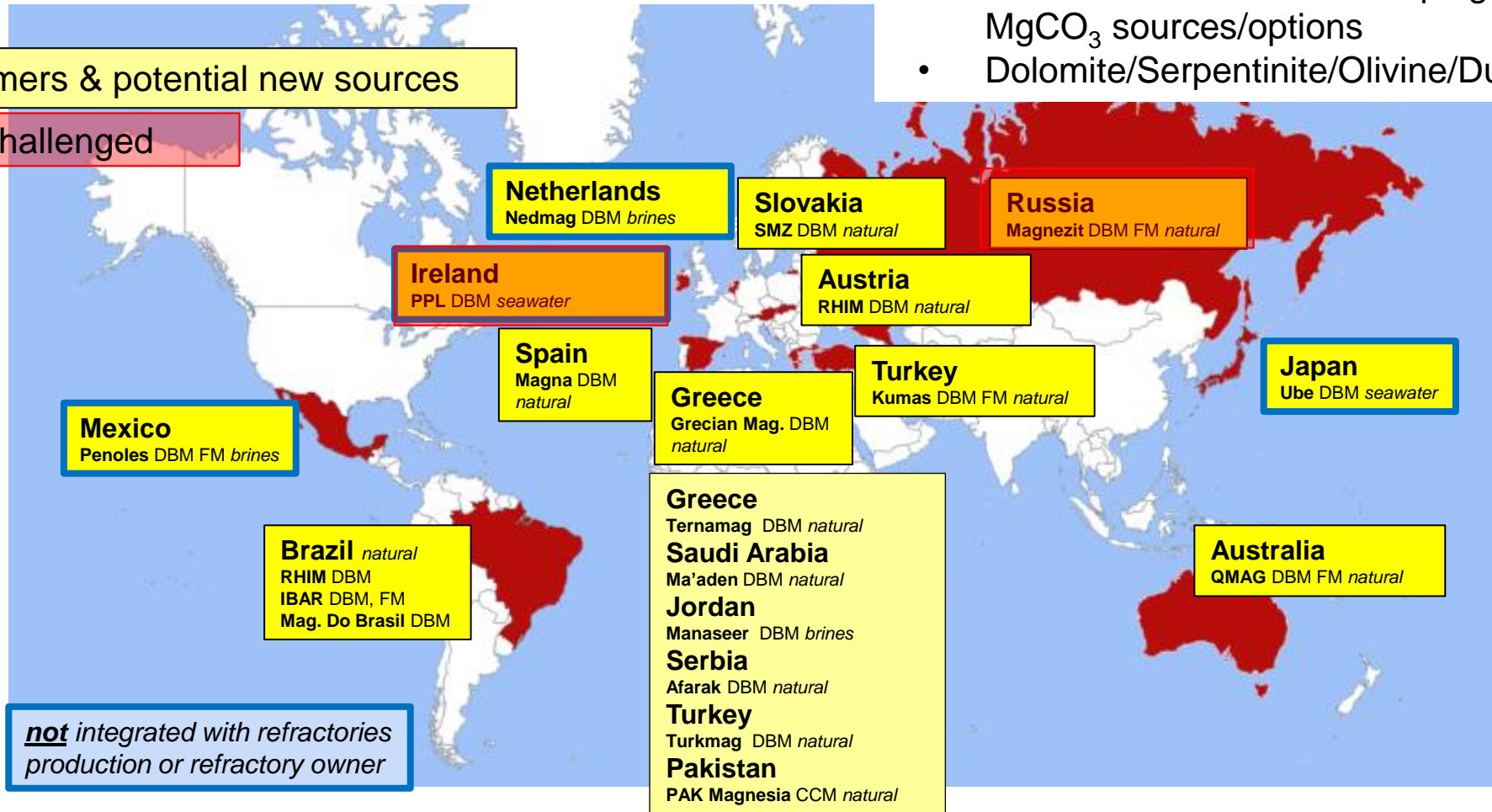
Magnesia overview

DBM/FM supply map

- Overall, few primary refractory DBM, fewer FM producers ex-China*
- Mostly natural source & integrated with refractories production/owner
- **Few independents, which are all synthetic**

- Interest in developing alt. sources ex-China, even as captive sources
- Ex-China magnesia producers strengthening resources, capabilities, vertical integration for supply security, strategy rethink
- Interest in trade and developing ex-China crude MgCO₃ sources/options
- Dolomite/Serpentinite/Olivine/Dunite resurgence?

- Recent newcomers & potential new sources
- Suspended | Challenged



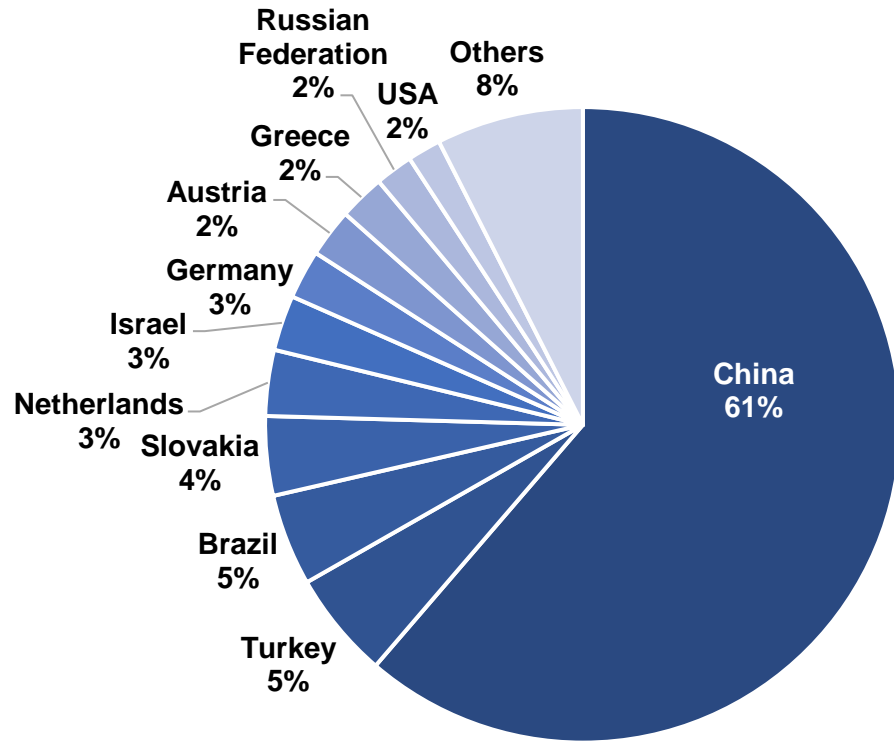
***not** integrated with refractories production or refractory owner*

* ie. DBM, FM major producers and non-captive/regional, ie. sell on world market, unlike eg. POSREC, small-scale Indian producers

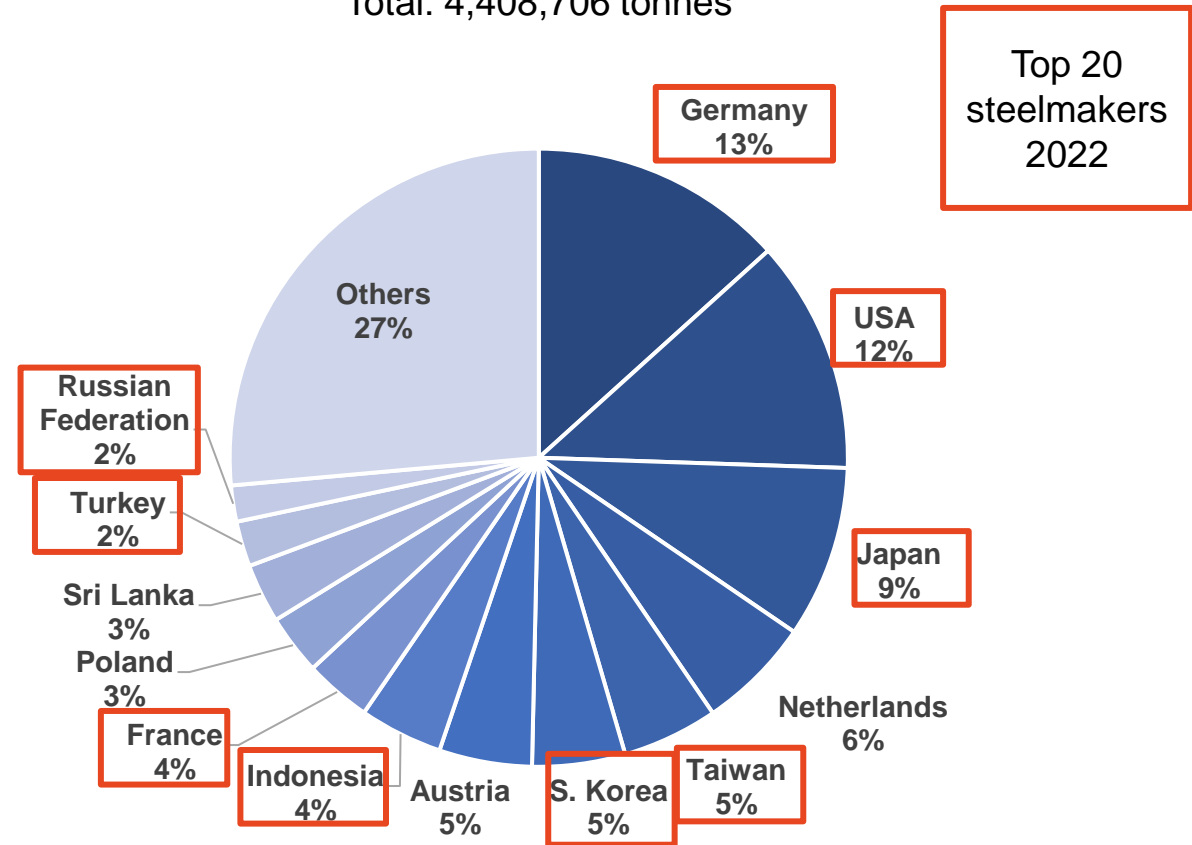
Magnesia overview

Trade: world magnesia exports & imports 2022

Exports: CCM/DBM/FM
Total: 5,059,309 tonnes



Imports: CCM/DBM/FM
Total: 4,408,706 tonnes



Source: data from ITC

Magnesia overview

Discussion points?

1. **Supply security:** influence of geopolitics/China outlook – low prices, energy costs up, until 2025? Then China MgO sector consolidation impact on price controls?
2. **Alternative sources of magnesia**
 - Turkey, Pakistan
 - Middle East developments: [**“Middle East Magnesia Supply Developments” by Ahmad Samara, Future Canvas, Jordan**]
 - Maaden exploring new mine Rokham mountains; 88-90% MgO; new rotary kiln for CCM/DBM
 - Manaseer closed plant 2021; Feb 2023 deal with Emirates Global Aluminum Co. (EGA) for 2x plant MDH expansion (270,000 tpa) export to UAE for Al production.
 - FM from kimberlite tailings from Panna mines, in Madhya Pradesh, India (NMDC)
 - MgO, MgCl₂ & Mg(OH)₂ from desalination projects, eg. NEOM, north-west Saudi Arabia (MgO 511ktpa, MgCl₂ 735ktpa, Mg(OH)₂ 778ktpa)

Magnesia overview

Discussion points?

4. **Continuing consolidation in refractories sector**, eg. RHIM/Bharat Refractories, HWI/Calderys
5. **Carbon capture & utilisation**
 - eg. Feb. 2023: MCI Carbon and RHI Magnesita signed long-term strategic partnership agreement to decarbonise components of RHI Magnesita's operations.
 - Grecian Magnesite EU Horizon Project ConsenCUS development of CO2 capture and utilisation pilot plant scheduled for August 2024.
6. **Market awareness in diversification**, eg. CCM in Ni/Co/REE processing for CRM demand

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Industrial Mineral Forums & Research

Chairpersons



Mike O'Driscoll
Director, IMFORMED



Alison Saxby
*Industrial Minerals Consultant,
Buchanan Saxby Associates*

Staff present to assist



Ismene Clarke
Director, IMFORMED



Rosie Kemp
Assistant, IMFORMED



Callum O'Driscoll
Assistant, IMFORMED

PROGRAMME DAY 1

WEDNESDAY 31 MAY

07:30 **Registration**

INTRODUCTION | ALTERNATIVE FUEL | SUPPLY CHAINS

08:30 **Opening Remarks & Introduction**

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

09:00 **Welcome Address: Celebrating 120 years of serving the magnesia market**

Dr Alexander Sunder, Global Director Magnesia & Minerals, LEHVOSS Group, Germany

09:15 **Alternative fuel source: Biomass use in magnesite calcination**

John Robert McFarlane, Owner, AlbionDesign GmbH, Switzerland

09:45 **Refractory mineral supply chains: Zero China & Cold Peace?**

James Devlin, Managing Director, China Mineral Processing Sales Europe, UK

10:15 COFFEE

PROGRAMME

DAY 1

WEDNESDAY 31 MAY (continued)

SUPPLY: ITALY | TURKEY | PAKISTAN | KEYNOTE PANEL DISCUSSION

- 11:00 **Italian olivine for industrial applications**
Dr Sabrina Bonetto, Assoc. Professor, Dept. of Earth Sciences,
Univ. of Turin, Italy
- 11:30 **Turkmag: DBM from Erzurum (eastern Turkey) to the World**
Altuğ Çakmur, CFO, Turkmag Madencilik San. Ve Tic. AŞ, Turkey
- 12:00 **High grade natural caustic calcined magnesia supply from Pakistan**
Adnan Essa, Managing Director, Pak Minerals & Refractory Industry,
Pakistan
- 12:30 **KEYNOTE PANEL DISCUSSION – MARKET OUTLOOK**
- Moderator: Mike O’Driscoll, Director, IMFORMED, UK
 - Dr Christoph Beyer, Managing Director, QMAG Pty Ltd, Australia
 - Michael Fanger, Head of Division Minerals & Europe,
Cremer Erzkontor, Germany
 - Alvaro Lopes, BU Head Global-Minerals, RHI Magnesita, USA
 - Meera Sawhny, President Refractory Raw Materials,
Global Monarch FZC, UAE
 - Glenn McIntyre, Director Materials Technology,
HarbisonWalker International, USA

13:00 LUNCH

13:00 LUNCH sponsored by

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Beyond Trading

PROGRAMME DAY1

WEDNESDAY 31 MAY (continued)

CARBON CAPTURE & UTILISATION

- 14:30 **Developments for magnesia-minerals in carbon capture & sequestration**
Pol Knops, Chief Technical Officer, Paebbl, Netherlands
- 15:00 **Scaling ocean carbon dioxide removal with low-carbon magnesium hydroxide**
Jason Vallis, VP Operations, Planetary Technologies, Canada
- 15:30 **Transforming CO₂ from magnesite production into added-value construction products**
Dr. David Konlechner, Owner, KON Chemical Solutions eU, Austria

PROGRAMME DAY 1

WEDNESDAY 31 MAY (continued)

16:00 ROUNDTABLE BREAKOUT SESSION + COFFEE

Informal networking & discussion at hosted & themed roundtables

THEME	ROUNDTABLE HOST
Supply	Alison Saxby, Industrial Minerals Consultant, Buchanan Saxby Associates, UK
Processing	Jens-Michael Bergman, Sales Manager Europe/MENA/India, TOMA, Germany
Energy Transition	John McFarlane, Managing Director, AlbionDesign GmbH, Germany
Carbon Capture & Utilisation	Pol Knops, CEO, Paebbl, Netherlands Jason Vallis, VP Operations, Planetary Technology, USA
Refractories	Ted Dickson, Consultant, TAK Industrial Minerals, UK Glenn McIntyre, Director Materials Technology, HarbisonWalker International, USA
Speciality Markets	Shotaro Hida, Assistant Manager, Tokyo Sales Section, Ube Material Industries, Japan Isamu Fujikawa, Marketing & Planning Dept., Ube Material Industries, Japan Howard Head, Research Analyst, Project Blue, South Africa

Take coffee in a relaxed, informal networking and discussion session, share and gain insightful knowledge among your peers. Themed and hosted roundtables. Flexibility to change tables anytime.

17:00 CLOSE OF DAY 1



**LOCATION:
Carlo 1**



PROGRAMME

DAY 2

THURSDAY 1 JUNE

MARKETS 1: REFRACTORIES | JAPAN | BRUCITE

- 08:30 **Refractory grade magnesia: market review**
Ted Dickson, TAK Industrial Minerals, UK & Charles Semler, Semler Materials Services, USA
- 09:00 **Japan MgO market update | Thermal conductive MgO filler | MgO approaches for the environment market**
Kazuaki Hamada, Director, et al, Ube Material Industries Ltd, Japan
- 09:30 **Brucite, huntite, & hydromagnesite: sources & supply**
Dr Ian Wilson, Ian Wilson Consultancy, UK

09:45 COFFEE

MARKETS 2: HYDROXIDE & SULPHATE | CEMENTS

- 10:45 **Magnesium hydroxide & magnesium sulphate: applications review and outlook**
Samantha Wietlisbach, Head of Inorganics & Minerals Research & Analysis, S&P Global Commodity Insights, Switzerland
- 11:15 **Magnesia cements: review & recent research & development**
Dr Colum McCague, Technical Manager: MPA Cement, Mineral Products Association, UK
- 11:45 **Magnesium oxide in the dental investment market**
Peter Holland, Managing Director, Cermatpro Ltd, UK

PROGRAMME

DAY 2

Finale Lunch Thursday 1 June

- *Ristorante Delfino*, on Isola Bella
- 10min boat ride from hotel jetty
- After lunch, return to the Hotel or you can tour the island, hosting the sumptuous Baroque palace and luxuriant Italian gardens.



Schedule

- | | |
|-------|---|
| 12:30 | meeting hotel lobby |
| 12:45 | departure by boats |
| 13:00 | lunch at Delfino |
| 15:00 | boat back to Baveno |
| 15:30 | Guided tour of Isola Bella
Palace & Garden |
| 17:30 | boat back to Baveno |



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Industrial Mineral Forums & Research

Networking and knowledge for the industrial minerals business



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Sponsorship/Exhibit/Registration Enquiries

Ismene Clarke ismene@imformed.com | T: +44 (0)7905 771 494

Programme/Speaker Enquiries

Mike O'Driscoll mike@imformed.com | T: +44 (0)7985 986 255



- **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**

MINERAL RECYCLING FORUM 2024

Hilton Imperial Dubrovnik, 22-24 April 2024

Secondary raw material sources, supply, processing, and markets



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Refractories Window
www.refwin.com
Global Refractories E-Business Platform



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XII EUROPEAN CONGRESS OF **REFRACTORY RAW MATERIALS, MACHINERY & INSTALLATION**

Meliá Lebreros, Seville
13-14 March 2024

Gala Dinner followed by Congress on key aspects of
refractory raw material supply and applications



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MAGFORUM 2024



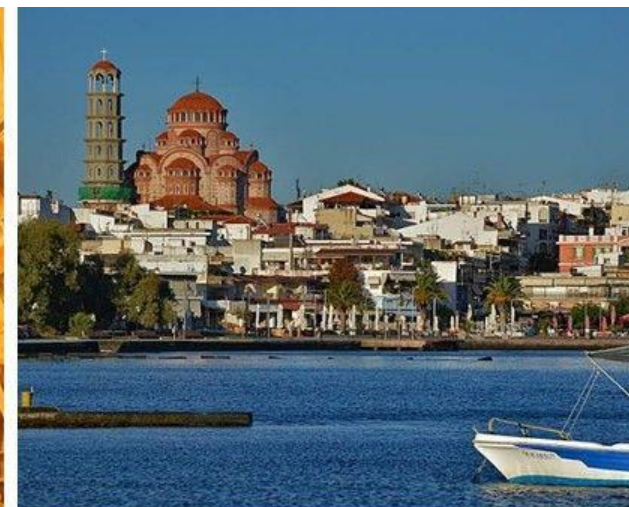
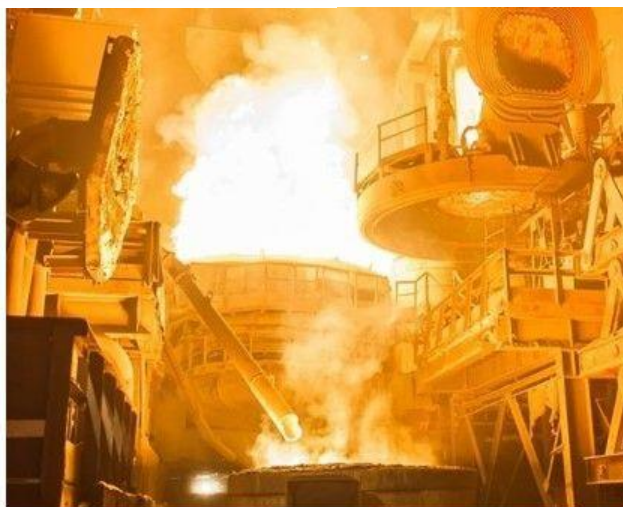
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CHINA REFRACTORY MINERALS FORUM 2024

InterContinental Dalian

21-23 October 2024



FIELD TRIP TO HAIMAG, HAICHENG THURS 24 OCT.

CALL FOR PAPERS | EARLY BIRD RATES

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Participate
Learn
Enjoy