

SUMMARY SLIDE DECK

FLUORINE FORUM 2022

Pan Pacific Hanoi
11-14 October 2022



The premier meeting for the global fluorine minerals & markets business

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HIGH-TECH MATERIALS



Supporting Partners

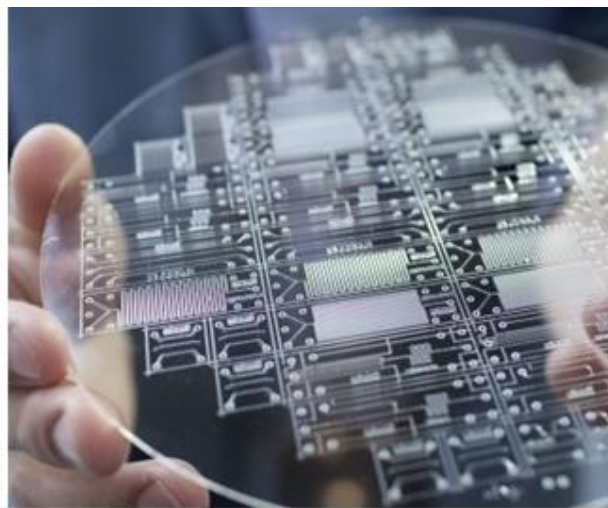


Coming up in 2023 (click logo for details)

FLUORINE FORUM 2023

Pullman Cannes Mandelieu

16-18 October 2023



The premier meeting for the global fluorine minerals & markets business

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Xin chào! Welcome!



Xin chào! Welcome!
Isn't it great to be back meeting in person!!

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refractories
WORLDFORUM
Manufacturing & Performance of High-Temperature Materials





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Bayalag Jonsh LLC
Bfluor Chemicals (Pty) Ltd
Britannia Refined Metals
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Fluorchemie Dohna GmbH
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Steel Services Sarl
Sumitomo Corporation
Sustainable Waste Management
SVSM
Tamer Mining
TANFAC Industries Ltd
Traxys China
Traxys Europe S.A
Traxys North America LLC
Vergenoeg Mining Co.
Xenops Chemicals GmbH & Co KG

It has been an important opportunity to connect with international stakeholders and strategic business partners, delving into the issues concerning the entire fluorine value chain from an increasingly sustainable perspective.

Tommaso Guilini, Chairman, Fluorsid SpA, Italy

Thank you for an excellent conference. This was my second Fluorine Forum attendance and definitely the best one so far.

Johan Brits, Project Director, Sepfluor, South Africa

The conference was fabulous, and it was nice getting together with everyone after the COVID years!

Bill Dobbs, Arena Fluor Materials LLC, Canada

Great event, congrats to the organising team! It was also an eye opener to realise how critical is the supply of fluoride to the EV battery materials.

Michael Gendron, Category Manager, Rio Tinto, Canada

The Koura team had a great week in Hanoi meeting with other producers and consumers of fluorine. Special thanks to IMFORMED, and to Masan High-Tech Materials who allowed us to visit their impressive Nui Phao mine.

Dustin Glazier, Product Manager Fluorspar, Koura, USA

Best Forum to date. Thanks for organising.

John Zielinski, Executive Buyer, Chemours, USA



PROGRAMME

WEDNESDAY 12 OCTOBER

08:00 **Registration**

09:00 **Welcome & Introduction**

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

OVERVIEW

09:30 **Acidspar market: the view from Vietnam**

William Parry-Jones, Head of Sales & Marketing Vietnam/Tungsten Raw Materials, Masan High-Tech Materials Corp., Vietnam

10:00 **Global fluorspar supply: what is changing in the industry?**

Euston Witbooi, Research Analyst, Project Blue, South Africa

10:30 COFFEE BREAK

MINING & PROCESSING

11:30 **Sustainable mining at the world's largest developed fluorspar source**

Wiekus Coetzer, Global Head of Mining, Koura Global, Mexico

12:00 **The role of make-up water, gangue mineralogy & electrokinetic potential in fluorite flotation**

Johan Brits, Project Executive, SepFluor Ltd, South Africa

12:30 LUNCH

West Lake Summit Room 19th Floor



PROGRAMME

WEDNESDAY 12 OCTOBER

REGIONAL SUPPLY: PAKISTAN | EUROPE

14:00 **Pakistan: Fluorspar and Gateway to Critical Minerals**

Shahid Hamid Jafri, CEO, Perfect Associates Ltd, Pakistan

14:30 **New European source of fluorspar with by-product lithium**

Peter Robinson, Managing Director, Fluorspar Ventures Ltd, UK

15:00 **COFFEE BREAK**



PROGRAMME



15:30 ROUNDTABLE BREAKOUT SESSION

Informal networking & discussion
Hosted & themed Roundtables

Exploration/Mining/Supply

Hosts: Peter Robinson, Managing Director, Fluorspar Ventures Ltd, UK;



Mongolia

Host: The Mongolian Fluorspar Association

Processing/FSA

Host: Johan Brits, Project Executive, SepFluor Ltd, South Africa

Fluorochemicals

Host: Samantha Wietlisbach, Director Minerals Research and Analysis,
S&P Global Commodity Insights, Switzerland

Li-ion batteries/EV

Hosts: Oliver Rhode, CEO, XENOPS Chemicals GmbH & Co. KG, Germany;
Chris Potgieter, Director, BFluor Chemicals (Pty) Ltd, South Africa

17:30 CLOSE OF DAY 1



PROGRAMME

THURSDAY 13 OCTOBER

08:30 Registration

MARKETS 1: FLUOROCHEMICALS

09:00 **Fluorochemicals trends & outlook**

John D. Zielinski, Executive Buyer, Chemours, USA

09:30 **Hydrofluoric acid: fundamental precursor for organic & inorganic fluorochemicals review & outlook**

Samantha Wietlisbach, Director Minerals Research and Analysis,
S&P Global Commodity Insights, Switzerland

10:00 **Diversification opportunities: FSA to HF, HF to AlF₃, HF to LiF/
LiPF₆**

Emre Sen, Sales Manager-Fluorine Technologies, Buss ChemTech AG,
Switzerland

10:30 COFFEE BREAK



PROGRAMME

THURSDAY 13 OCTOBER

MARKETS 2: EV BATTERIES | ALUMINIUM

- 11:30 **The unknown raw material disconnect: impact of e-mobility on fluorspar demand**
Oliver Rhode, CEO, XENOPS Chemicals GmbH & Co. KG, Germany
- 12:00 **The role of fluorine in battery systems: Beyond electrolytes**
Chris Potgieter, Director, BFluor Chemicals (Pty) Ltd, South Africa
- 12:30 **Comparison of LBD and HBD aluminium fluoride in aluminium smelting**
Hanna Sjoberg, CEO, Alufluor AB, Sweden &
& Jesper Holmquist, Commercial Director, Alufluor AB, Sweden

13:00 LUNCH & CLOSE OF CONFERENCE

Missed attending the Forum?

The full set of PDF presentations are available for purchase.

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

FIELD TRIP PROGRAMME

Pan Pacific Hanoi to Núi Pháo Ma

+

← → ↺

google.com/maps/dir/Pan+Pacific+Hanoi,+Đường+Thanh+Niên,+Road,+Trúc+Bạch,+Ba+Đình,+Hà+Nội/Công+ty+TNHH+Khai+thác+ch...

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Pan Pacific Hanoi, 1 Đ. Thanh Niên, Road

📍

Work (Núi Pháo Masan Mine)

+

Depart at

⌵

🕒 8:00 AM

📅 Fri, Oct 14

Options

📱

Send directions to your phone

🚗

via

typically 1 hr 30 min - 2 hr 10 min

ĐCT07

Arrive around 10:10 AM

97.0 km

Details

Explore Núi Pháo Masan Mine

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⋮

Restaurants

Hotels

Gas stations

Parking Lots

More

MASAN

HIGH-TECH MATERIALS

Work

📍

Thái Nguyên

Sông Công

Ba Hàng

Phụ Thọ

Viet Tri

Vinh Yen

Son Tây

Hoa Binh

Tuyen Quang

QL3

QL37

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CT05

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FLUORINE FORUM 2022

Pan Pacific Hanoi

Hải Dương

Haiphong

Quảng Yên

đảo Hà Nam

Uông Bí

Chí Linh

Từ Sơn

Bắc Ninh

Bắc Giang

Phong Vân

Tam Tiến

Son Tr

Layers

📷

Typical traffic

Fast

Slow

🔵

S M T W T F S

Friday, 8:00 AM

8:00 AM

12:00 PM

4:00 PM

8:00 PM

Map data ©2022

Global

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Send feedback

20 km



SETTING THE SCENE

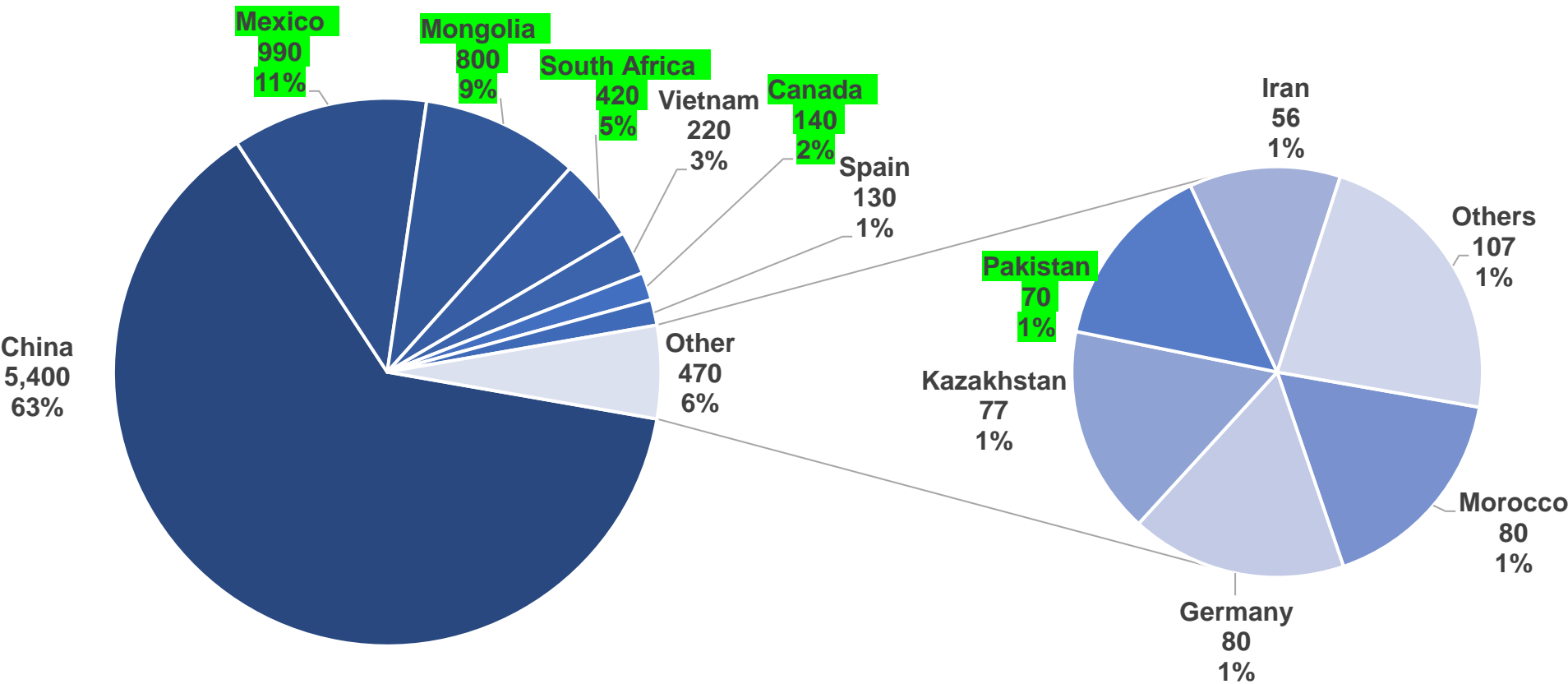
Fluorspar market overview

Supply & Market Highlights



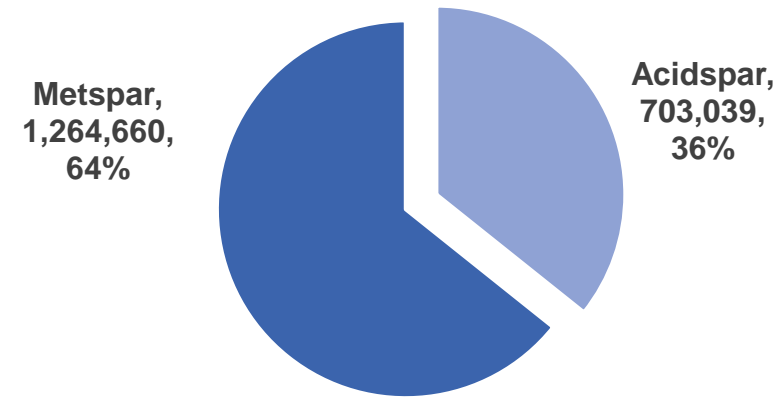
World fluorspar production 2021

Total: 8.6m tonnes ; 7.6m tonnes 2020 (charts below in '000s tonnes)



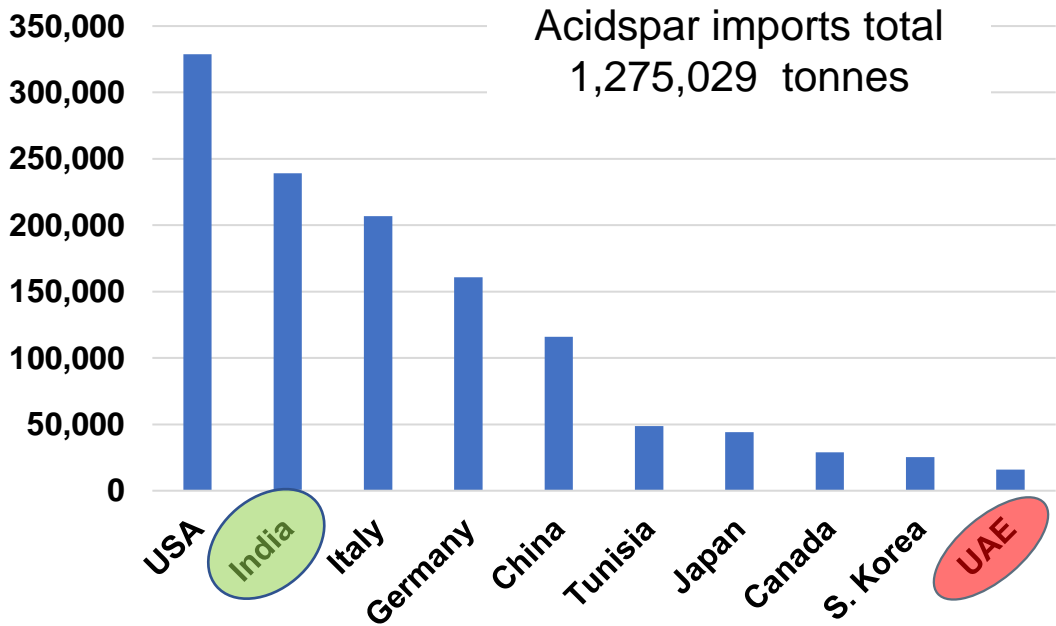
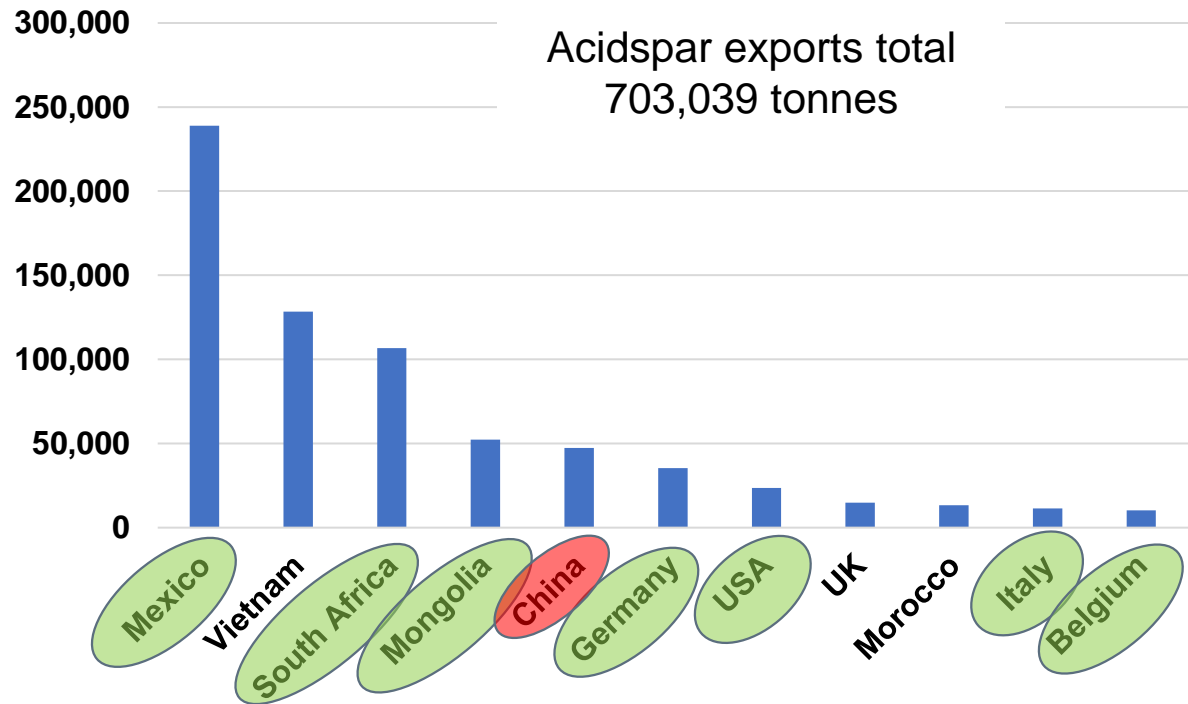
Source: USGS 2022

2021 fluorspar exports total:
1,967,699 tonnes



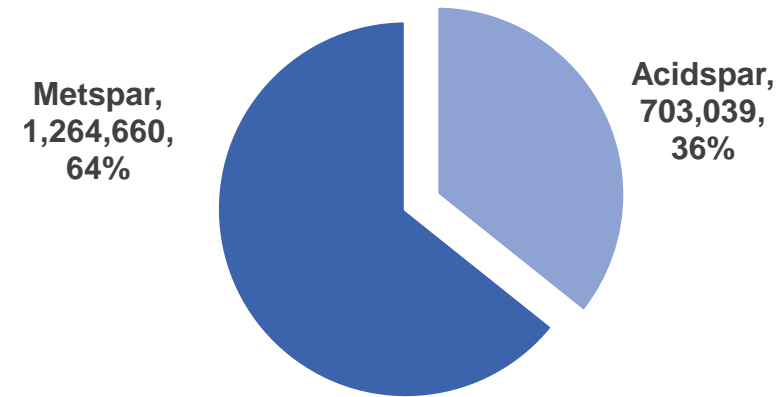
World fluorspar trade 2021

Acidspar exports & imports



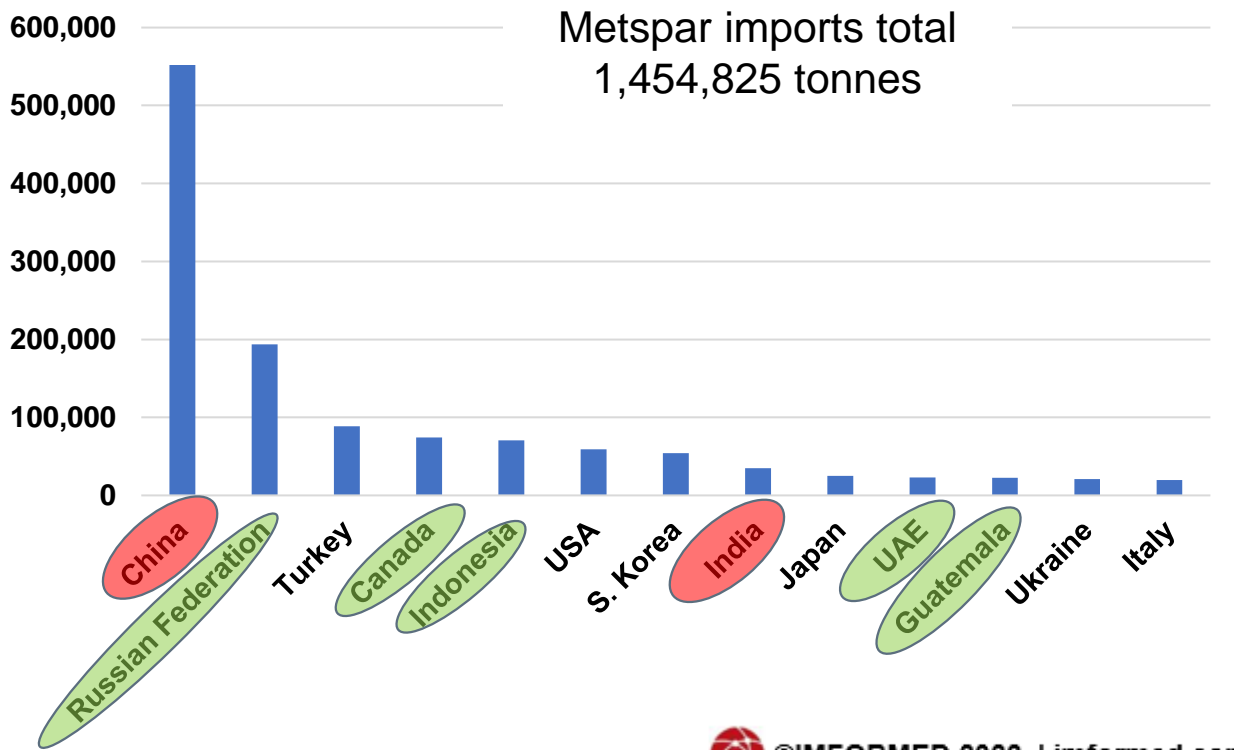
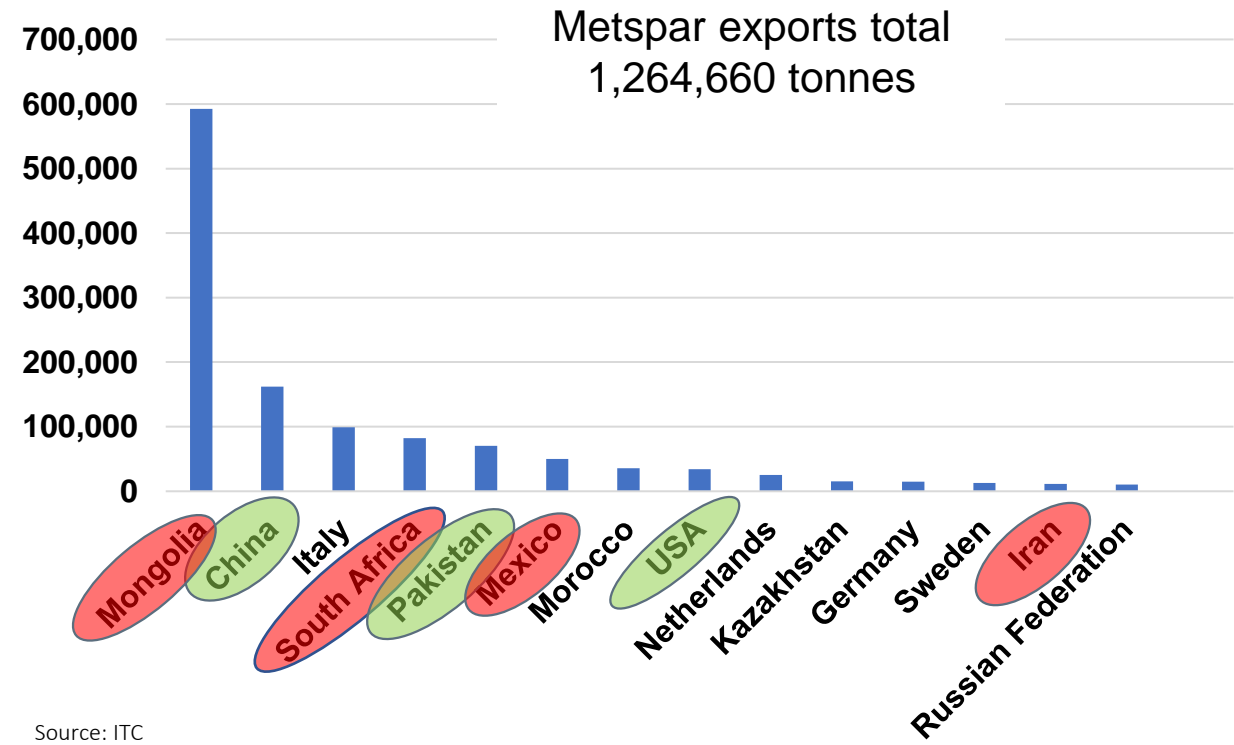
Source: ITC

2021 fluorspar exports total:
1,967,699 tonnes



World fluorspar trade 2021

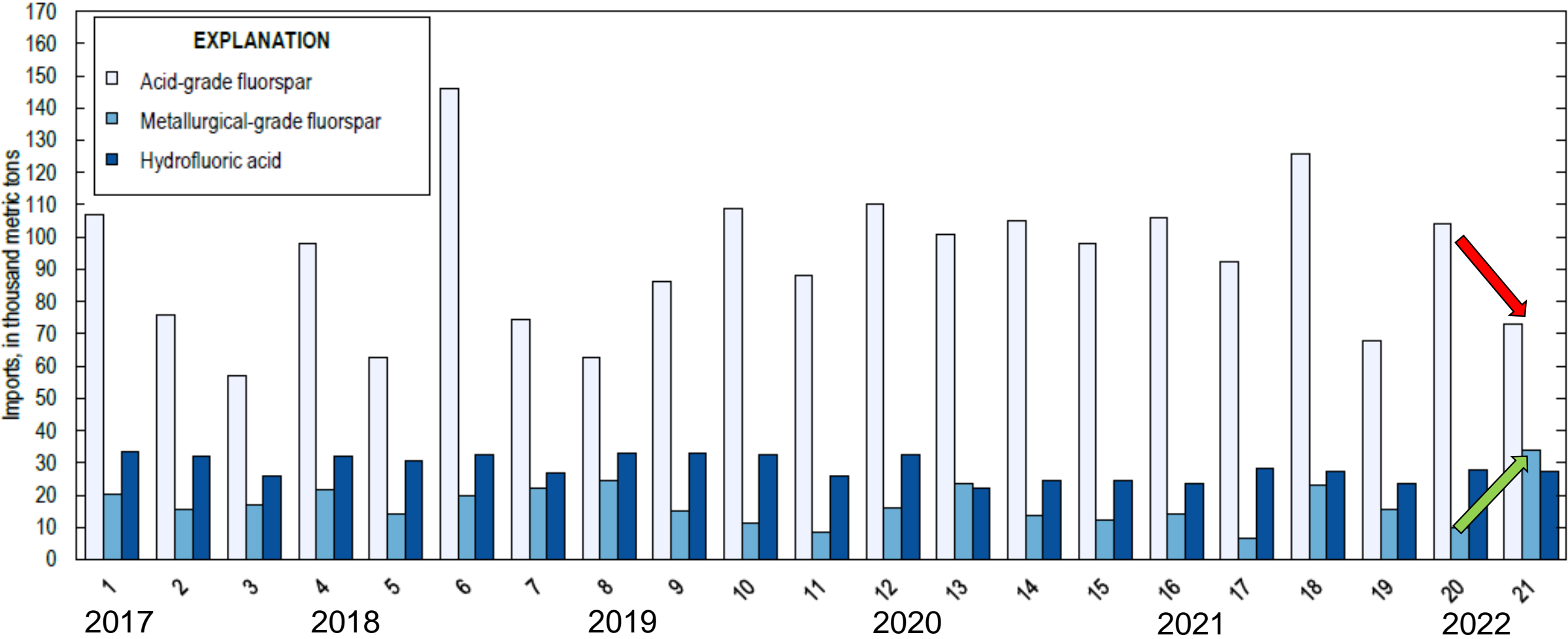
Metspar exports & imports



Source: ITC

US fluorspar import trends

000s tonnes; Q2 2017- Q2 2022



US Q2 fluorspar imports 107,000 tonnes
73,100t acidspar: -21% on Q221, -30% on Q122; Mexico (57%), China (38%)
33,800t metspar: +400% on Q121, +240% on Q122; Mexico (95%)



Supply highlights

- **Canada Fluorspar:** Feb. 2022 idled in receivership, new owner & restart “imminent”.
- **Koura Global:** Q1-Q2+ 2022 *force majeure* for fluorspar supply contracts owing to geotechnical and safety issues at mine ramp at Las Cuevas Mine; remedial work ongoing;
 - H1 2022 Mexico fluorspar production 499,000t, slight decrease from H121
 - H1 2022 Mexico exports: acidspar decreased by 46%; metspar decreased by 52%
- **Prices reaction:** in Q1 initially increased to \$500/t, eased later to \$450-500/t





Supply highlights

- **SAMINE:** Dec. 2021 El Hammam underground fluorspar mine in Morocco closed.
- **Ares Strategic Mining:** developing Lost Sheep Fluorspar Project, Spor Mountain area (a former fluorspar mining district), Juab county, Utah, 214 km south-west Salt Lake City;
 - July 2022: received plant equipment and materials for construction of 3-storey metspar plant in co-operation with strategic partner, Mujim Group, China (fluorspar processor in China, Laos, and Thailand).
 - Aug. 2022: approval of US\$4.92m financing from US Dept. of Agriculture.
- **Mineraria Gerrai:** plans to restart fluorspar production at Silius mine, Sardinia, Italy. Preparation works until end-2023, estimated ready for production early 2024.
- **Other potential sources:** project developments in UK, Germany/Czech Rep.; potential in South Africa and Australia; FSA plant interest increasing.
 - eg. Arkema/Nutrien \$150m., 40,000 tpa AHF plant at Aurora, North Carolina, scheduled to start up 2022.





Market drivers

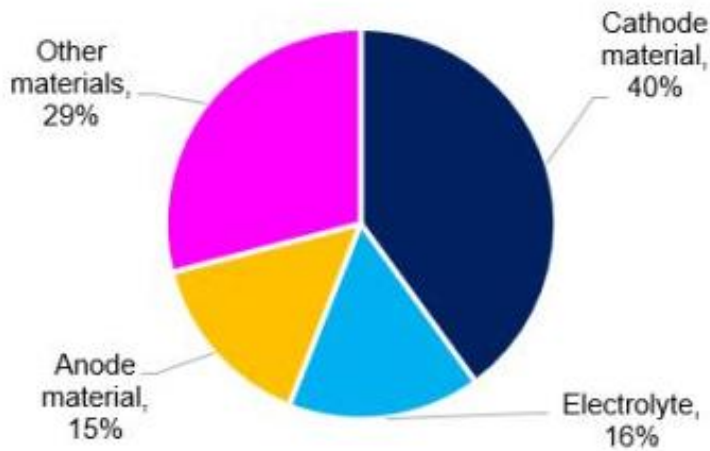
- **Fluorochemicals evolution:** ongoing development of new generation low GWP fluorochemicals in refrigerant and other applications.
 - April 2022: new EC proposals to strengthen F-gas regulation with more stringent HFC bans from 1 January 2027; acceleration of phase down could see current allowable quota slashed by around 50% in 2024.
 - Sept. 2022: US ratification of Kigali Amendment to phase down HFC refrigerants (138th country). Commits countries to cut production and consumption of HFCs by >80% over the next 30 years; estimated to prevent up to 80bn tonnes CO₂ equivalent emissions by 2050.
 - eg. Oct. 2022: Arkema plans to increase supply of low GWP HFO 1233zd through plants in China and the USA
 - eg. July 2022: Koura new refrigerant R468C as a lower GWP alternative to R410A or R32.



Market drivers

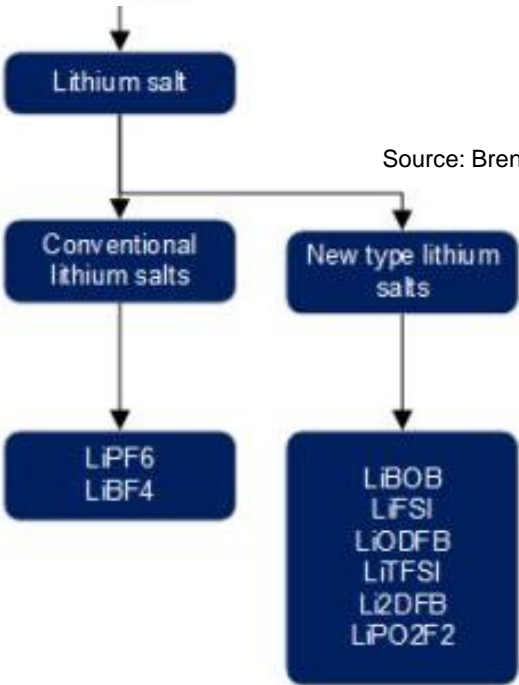
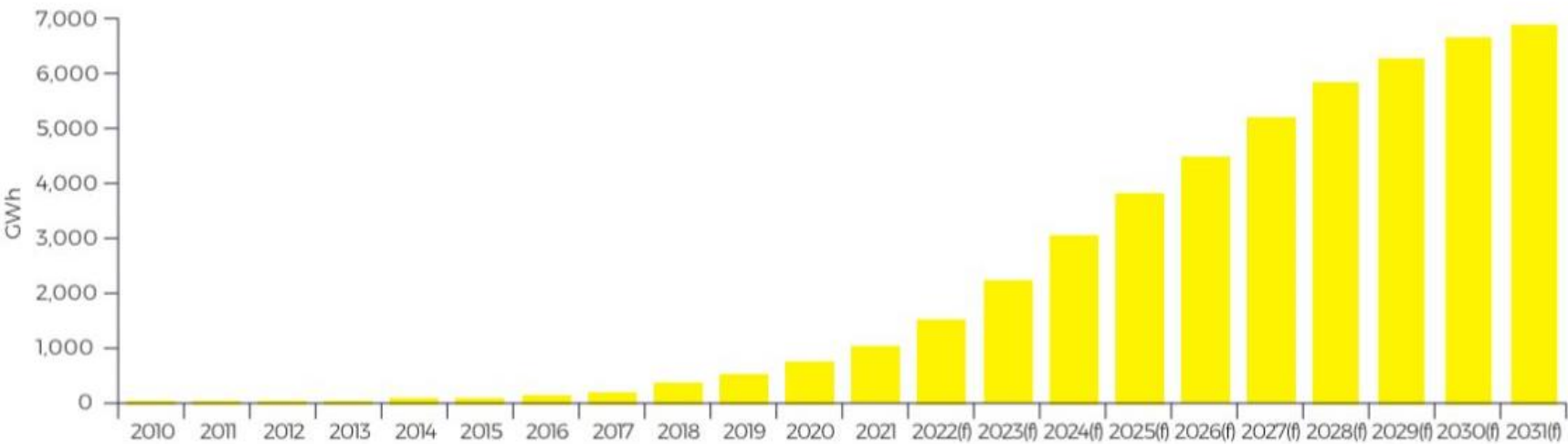
- **Lithium ion battery evolution:**
 - Fluorine essential feedstock raw material for LiPF6, LiFSI (electrolyte) and PVDF (binder), important components of lithium-ion batteries (LIB).
 - Also for HF used in graphite (anode material) processing (although other eco-friendly processes emerging).

Lithium-Ion Battery Composition



3 tonnes fluorspar to produce 1 tonne LiPF6 (via AHF)
Oliver Rhode (2022)

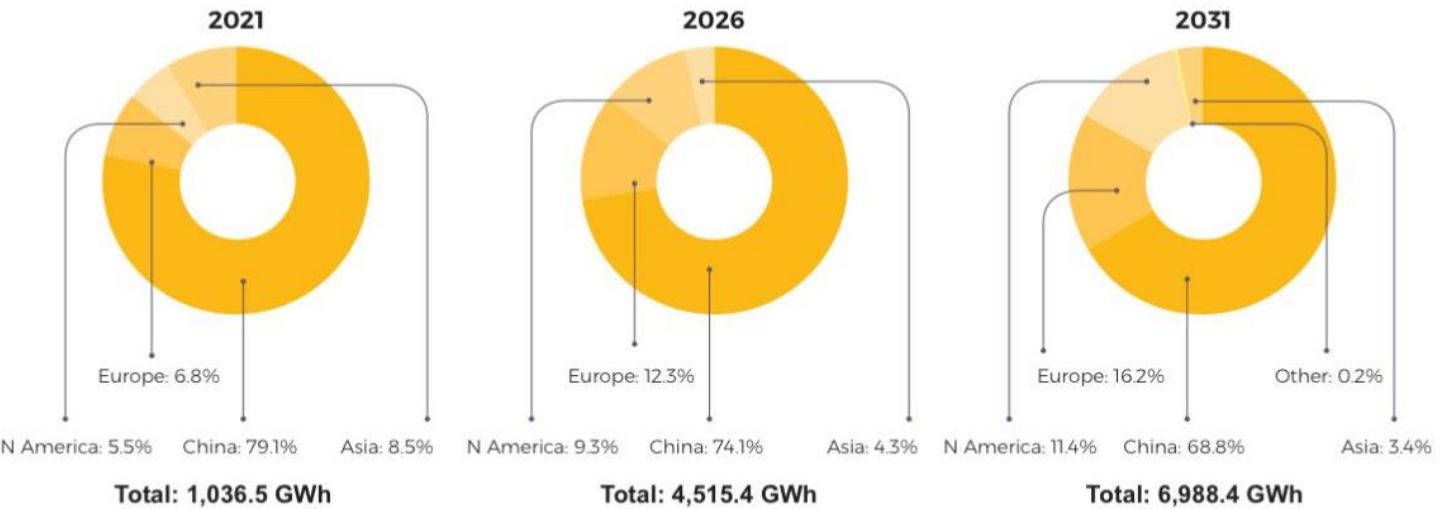
World Lithium Ion Gigafactory Capacity 2010-2031



Source: Brendan Jephcott

Market drivers: LIB market geography

Lithium ion Battery Cell Capacity by Region



79%
8%
7%
5%

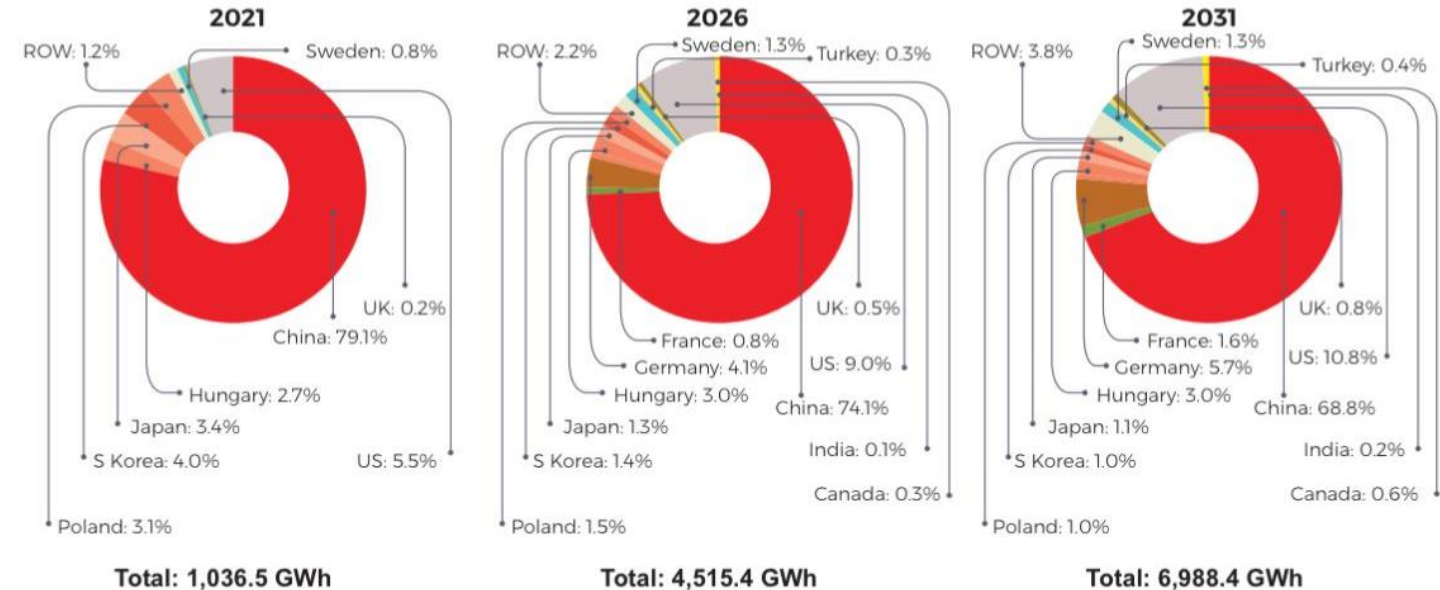
China
Asia (ex-China)
Europe
USA

“The 10 year trajectory has started to shift towards more EV battery capacity in US and Europe, but not by much.”



Simon Moores, CEO, Benchmark Mineral Intelligence

Lithium ion Battery Cell Capacity by Country

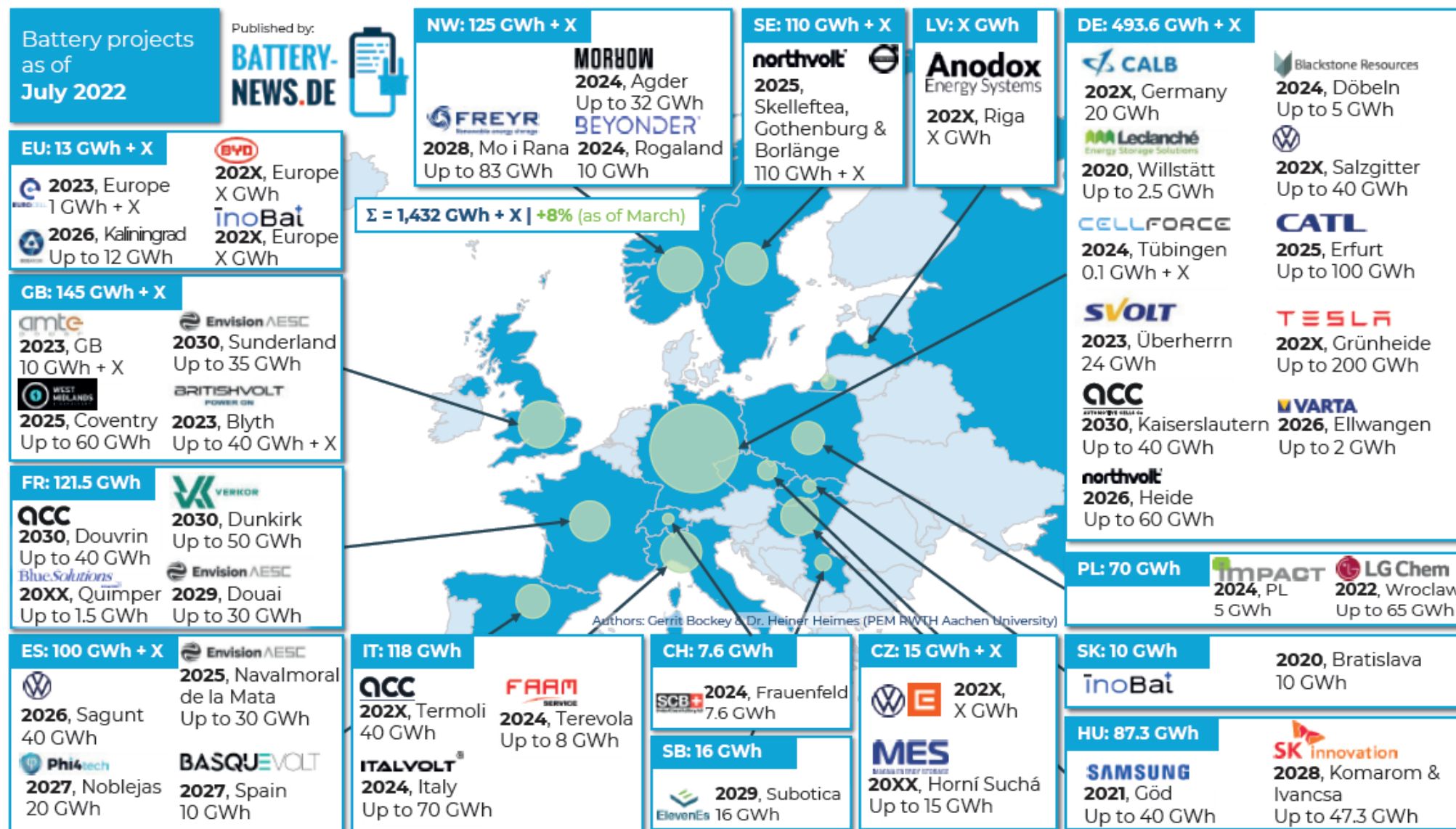


China still on track to hold the way of industrial power in EV battery manufacturing (~70%) in 2031.”

Source: Benchmark Mineral Intelligence



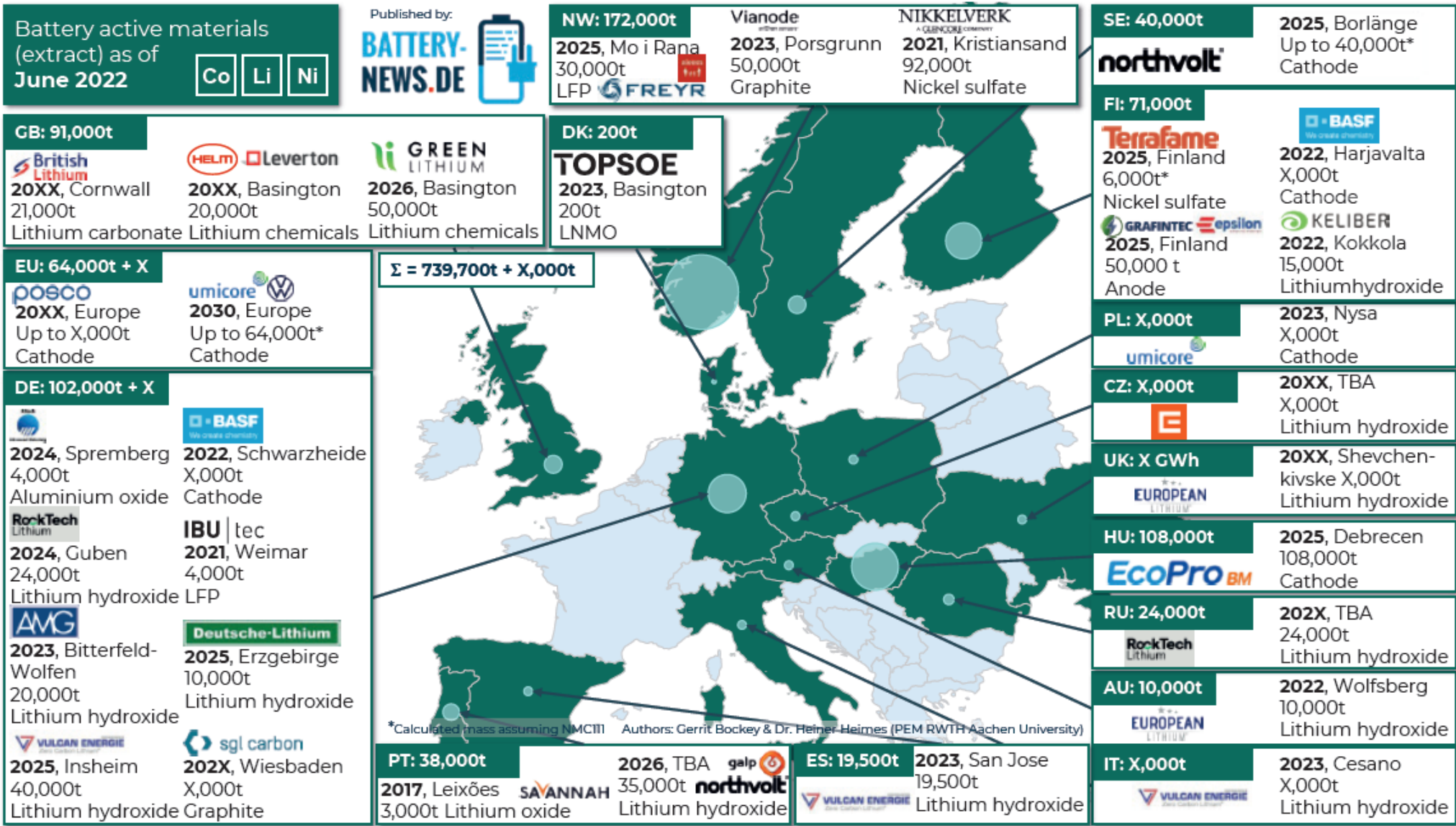
Market drivers: LIB market geography – Europe manufacturing site projects



Source: www.battery-atlas.eu



Market drivers: LIB market geography – Europe active raw material projects



Source: www.battery-atlas.eu



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Programme/Speaker Enquiries

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

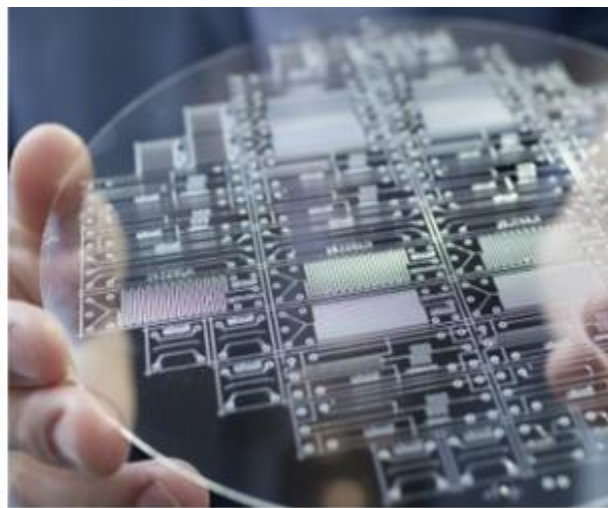


- **Launched in January 2015**
- **Extensive experience & reputation**
- **Specialising in conferences & market research in:**
 - **Industrial Minerals Supply/Demand**
 - **Magnesia**
 - **Refractory Minerals**
 - **China**
 - **Mineral Recycling**
 - **Fluorine**
 - **India**
 - **Oilfield Minerals**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

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MINERAL RECYCLING **FORUM** 2023

Hilton Imperial Dubrovnik, 28-30 March 2023

Secondary raw material sources, supply, processing, and markets

MAG**FORUM** 2023

Magnesium Minerals & Markets Conference
30 May-1 June 2023, Grand Hotel Dino,
Baveno, Lake Maggiore (Milan)

Field Trip: Nuova Cives Olivine

FLUORINE **FORUM** 2023

Pullman Cannes Mandelieu
16-18 October 2023 

OILFIELD MINERALS & MARKETS **FORUM** HOUSTON 2023

Hilton Houston Post Oak, Hilton, 9-11 May 2023

CHINA REFRACTORY MINERALS **FORUM** 2023

InterContinental Dalian
12-15 September 2023

Field Trip: Haimag Magnesite



SALT **FORUM** 2023

Strand Hotel Swakopmund, Namibia
6-9 November 2023

The new conference for global salt supply and markets

Field Trip: Walvis Bay Salt



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