CRITICAL MINERALS ASSOCIATION

MAY 2021

CMA G7 EVENT: THE IMPORTANCE OF MINING TO SOCIETY - 11 JUN | IN FALMOUTH & LIVESTREAMED
CMA: CRITICAL MINERALS AS A DRIVER FOR SUSTAINABLE DEVELOPMENT
RESPECTIBLE RAW MATERIALS CONFERENCE
ROSKILL: SOURCING THE LOWEST CARBON LITHIUM FOR EUROPE’S BATTERY SECTOR
CORNISH LITHIUM: SATELLITES FOR BATTERIES
Welcome to our May Critical Minerals Association monthly newsletter & updates on the critical minerals space.

Read on for:

- CMA G7 Event: The Importance of Mining to Society - 11 June at 10am
- APPG Highlights - 'Canada's Critical Minerals Approach'
- CMA at the Responsible Raw Materials Conference:
  - Critical Minerals as a Driver for Sustainable Development
  - Public Perception of Mining: Communicate through Connection
  - Interview with Alexander Stafford MP
- Roskill: Sourcing the Lowest Carbon Lithium for Europe’s Battery Sector
- Cornish Lithium: Satellites for Batteries Project
- IEA: The Role of Critical Minerals in Clean Energy Transitions
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- MEI Conferences: Sustainable Minerals '21
- Globe Series: Circular Economy Virtual Event

This month's newsletter has been put together by our newest member of the team - Olimpia Pilch, Business Development & Communications Associate!

Kirsty & Jeff

SUBSCRIBE TO OUR NEWSLETTER UNDER 'CONTACT'

Got a suggestion? Want to feature in next month's newsletter? Contact olimpia@criticalmineral.org

Want to learn more? Check out our website: https://www.criticalmineral.org/ & follow us on twitter @CMA_Minerals
CMA G7 Event: Importance of Mining to Society

Friday 11 June 2021 | 10 AM - 11 AM BST | Cornwall House, Falmouth & LIVESTREAM

The Critical Minerals Association is delighted to be hosting the G7 Event, "Importance of Mining to Society", on 11th June. The in-person event will take place at Cornwall House in Falmouth and will also be livestreamed! Our speakers include:

- Jeff Townsend, Co-founder of CMA
- Lucy Crane, Chair of CMA Perception of Mining Group, Senior Geologist at Cornish Lithium
- John Murray, Founder of Swann Global

For in-person attendance
REGISTER HERE

For livestream
REGISTER HERE

Join the Critical Minerals Association in Falmouth at the G7 Event:

- Jeff Townsend, Co-founder of CMA
- Lucy Crane, Senior Geologist, Cornish Lithium
- John Murray, Founding Principal of Swann Global

CMA G7 EVENT: THE IMPORTANCE OF MINING TO SOCIETY

FRI, 11 JUNE @ 10AM BST
Cornwall House, Falmouth & LIVESTREAM
APPG Highlights - 'Canada's Critical Minerals Approach'

The APPG Critical Minerals hosted its latest event: 'Canada's Critical Minerals Approach' on Wednesday 26th May. The discussion featured:

- Steve Double MP, Chair, APPG Critical Minerals
- Alexander Stafford MP, Vice-Chair, APPG Critical Minerals
- Susan le Jeune d'Allegeershecque CMG, British High Commissioner to Canada
- Shawn Tupper, Associate Deputy Minister, Natural Resources Canada
- Jeff Labonté, Assistant Deputy Minister for Lands and Minerals, Natural Resources Canada
- Mark Smith, Mining Sector Manager, UK Government Department for International Trade

HIGHLIGHTS & RECORDING HERE

APPG CRITICAL MINERALS: CANADA'S CRITICAL MINERALS APPROACH

- Steve Double MP, Chair of the All-Party Parliamentary Group for Critical Minerals
- Susan le Jeune d'Allegeershecque CMG, British High Commissioner to Canada
- Shawn Tupper, Associate Deputy Minister, Natural Resources Canada
- Jeff Labonté, Assistant Deputy Minister for Lands and Minerals, Natural Resources Canada
- Alexander Stafford MP, Vice-Chair of the All-Party Parliamentary Group for Critical Minerals
- Mark Smith, Mining Sector Manager at Department for International Trade (DIT)
CMA's Kirsty Benham and Jeff Townsend recently featured in the Responsible Raw Materials 2021 Annual Conference, 'ESG Toolkit for Responsible Sourcing', and discussed:

- how and why the CMA was established;
- the problems for critical mineral companies when viewed through an ESG prism;
- how as an industry association the CMA can help companies and the sector be a force for good in the delivery of the Sustainable development goals.
Co-chairs of CMA's Perception of Mining Working Group, Lucy Crane and Ben Lepley discussed public perception of mining and how effective communication can help educate the general public on the importance of sustainable mining to society.

The public perception of mining working group was formed with the purpose of engaging with and educating the wider public about the extractives industry, and its pivotal role in society.
Responsible Raw Materials recently interviewed Alexander Stafford MP, vice-chair of Critical Minerals APPG, to discuss UK’s role in responsible, sustainable critical minerals mining and processing.

‘The United Kingdom must lead the world in the responsible ESG mining and processing of critical minerals.’

- House of Commons, UK Parliament

HIGHLIGHTS & RECORDING HERE
The European battery-chain continues to show an increased preference for battery-quality lithium hydroxide, over lithium carbonate; although some entry-level models may utilise chemistries more tailored towards lithium carbonate. But with lithium hydroxide having a higher CO2 intensity than carbonate on a comparable basis, a low-carbon source of supply is even more critical.

Large-scale lithium extraction and refining capacity centres worldwide with transport distances for feedstock material.

**Europe**
- Refining LiOH capacity

**China**
- Brine extraction
- Mineral extraction
- Refining Li$_2$CO$_3$ & LiOH capacity

**Australia**
- Mineral extraction
- Future refining LiOH capacity

**Chile & Argentina**
- Brine extraction
- Refining Li$_2$CO$_3$ & LiOH capacity

Source: Roskill
Note: 1 - Australian lithium hydroxide refining capacity is yet to come online
Cornish Lithium partnered with a consortium of remote sensing and machine learning specialists in a project funded by the UK Space Agency (UKSA) under the National Space Innovation Programme (NSIP).

This project worked towards understanding how automating processes, specifically the interpretation of satellite imagery, could be utilised to create prospectivity tools for key technology metals in Cornwall. This smart approach to exploration, utilising machine learning to define targets from remote sensing data, coupled with targeting the elements that are key for the transition to a clean, green future, is crucial to Cornish Lithium’s ethos of employing cutting edge techniques to enable an environmentally conscious exploration programme.
Minerals are essential components in many of today’s rapidly growing clean energy technologies – from wind turbines and electricity networks to electric vehicles. Demand for these minerals will grow quickly as clean energy transitions gather pace. This new World Energy Outlook Special Report provides the most comprehensive analysis to date of the complex links between these minerals and the prospects for a secure, rapid transformation of the energy sector.

"Today, the data shows a looming mismatch between the world’s strengthened climate ambitions and the availability of critical minerals that are essential to realising those ambitions."

- Dr Fatih Birol, IEA Executive Director

The Role of Critical Minerals in Clean Energy Transitions

Part of World Energy Outlook
Tirupati Graphite plc is pleased to announce that Tirupati Graphene and Mintech Research Centre (‘TGMRC’), has developed a ground-breaking graphene-aluminium composite which exhibits significantly higher conductivity and strength properties over aluminium and comparable to copper.

The Al-Gr Composite successfully combines graphene with aluminium resulting in enhanced thermal and electrical conductivity and improved mechanical properties retaining aluminium's light weight:

- Micro-hardness increased >300% over aluminium, which is 50% higher than copper
- Thermal conductivity increased to >200% over aluminium, which is better than copper values
- Electrical conductivity increased to >150% over aluminium, which is >95% that of copper; the Company aims to increase this with further optimisation
- The composite is almost free from oxidation and carbide forms of aluminium, a critical achievement breaking the key technological barrier in development of the Composite

READ ON HERE
Mkango Announces Results of Flotation Piloting

Mkango Resources Ltd is pleased to announce results of the flotation pilot plant programme completed at ALS Metallurgy in Perth, Australia, which was effective in scaling up a new, optimised flotation regime for the Songwe Hill Rare Earths Project (“Songwe”) located in Malawi.

The flotation piloting programme demonstrated that the flotation process is robust and straightforward to scale up and the results support a significant increase in both flotation recoveries and concentrate grade for the feasibility study versus the design criteria for the 2015 pre-feasibility study for Songwe:

- Significant increase in flotation recovery of total rare earth oxides (“TREO”) to 74% from 67%;
- Tripling of flotation concentrate grade to 15% TREO from 4.7% TREO;
- Substantial increase in flotation upgrade, with the optimised flotation regime increasing the run-of-mine (“RoM”) ore grade by 10 times versus three times in the pre-feasibility study; and
- Positive impact on downstream integrated hydrometallurgical operations.

READ ON HERE
Change is happening! Mining companies and regulators across the region are adapting to new global expectations around ESG (Environment, Social and Governance). But due to its strong historical focus on sustainability, the region is well placed to lead the way in the wider European context by showing how mining can be responsible.

SRK’s ESG team have worked on many projects in the Nordic region for over 15 years. Through their due diligence and advisory work, they recognise that strong regulation and active stakeholders across the region mean permitting processes are generally robust, albeit quite time consuming. Industry itself is recognising the need to change with companies across the region implementing voluntary actions to improve sustainability. So with the current global focus on all things ESG, will things change for Nordic mining projects?
There are many fantastic people, working hard behind the scenes, involved in all aspects of CMA. Each month, we will be bringing new faces into the spotlight!

This month's spotlight goes to Neal Brewster, Chief Economist at Roskill and Laurens Tijsseling, Sustainability Manager at Minviro.

Neal Brewster

Perception of Mining Group, Critical Minerals Association

BA in Economics at Nottingham University, MSc in Economics at Bristol University

Chief Economist, Roskill

Laurens Tijsseling

ESG Working Group, Critical Minerals Association

BSc in Applied Physics at TU Delft, MSc in Resource Engineering from Aalto University, RWTH Aachen and TU Delft

Sustainability Manager, Minviro
Critical Minerals News

The following May news articles from Argus Media, Mining Weekly, Mining.com, Proactive Investors, Roskill and others, provide an overview of critical mineral mining for:

- Cobalt
- Copper
- Graphite
- Lithium
- Manganese
- Nickel
- Tin
- Tungsten
- Rare Earth Elements

The Critical Minerals Association takes no credit for any articles and makes no endorsement of any of the content.
Critical Minerals

• Global [7.5.21]
  - How blockchain will help miners meet evolving ESG demands. The founder and executive co-chairman of Ivanhoe Mines sees a more sustainable future for the sector – and one in which the environmental impact of mining will be baked into commodity prices.

• Global [7.5.21]

• Europe
  - **Ireland: Xerotech [20.5.21]**
    - Lithium-ion battery manufacturer Xerotech announced that it will qualify one of its core proprietary battery safety technologies for space applications, in conjunction with the European Space Agency.
      - [https://www.mining.com/li-ion-battery-manufacturer-to-venture-into-space/](https://www.mining.com/li-ion-battery-manufacturer-to-venture-into-space/)

• Oceania
  - **Australia: CSIRO [20.5.21]**
    - Australia’s National Science Agency released a report which argues that critical energy minerals can provide an important source of economic growth for Australia and help to power a global transition towards zero emissions.
Electric Vehicles

• **Global [6.5.21]**
  - Demand for battery materials is set to increase sharply and outpace supply in the next 20 years, with electric vehicles (EVs) and battery storage leading the change. But recycling and reusing batteries could cut demand for raw materials such as lithium and nickel by up to 12pc by 2040, according to the International Energy Agency (IEA).

• **Europe**
  - **UK [21.5.21]**
    - One in four UK households intend to buy an electric car in the next five years, as a ban on the sale of new petrol and diesel vehicles in 2030 approaches, according to research.
      - [https://www.theguardian.com/business/2021/may/21/65m-households-uk-electric-car](https://www.theguardian.com/business/2021/may/21/65m-households-uk-electric-car)
  - **UK [22.5.21]**
    - The Oxford Superhub will open at Redbridge Park and Ride in Abingdon Road later this year, and have 38 fast and ultra-rapid chargers.
      - [https://www.bbc.co.uk/news/uk-england-oxfordshire-57206440](https://www.bbc.co.uk/news/uk-england-oxfordshire-57206440)

• **North America**
  - **Canada [19.5.21]**
    - Canada has a “once-in-generation” opportunity to establish itself as a major player in the global battery sector, but it needs to act fast to seize the opportunity, a new report reflecting the views of stakeholders across the electric vehicle (EV) supply chain shows.
      - [https://www.mining.com/canada-has-right-ingredients-to-be-ev-battery-leader/](https://www.mining.com/canada-has-right-ingredients-to-be-ev-battery-leader/)
Cobalt

• Global [9.5.21]
  ▪ Cobalt sulphate prices fell by 12.9% month-on-month in April, but the market is set to tighten in the middle of the June quarter as restocking activity in China begins, potentially pushing prices higher once again, Benchmark Mineral Intelligence said in a report on Friday.

• Global [18.5.21]

• Africa
  ○ DRC: Glencore [20.5.21]
    ▪ Glencore, Umicore, Eurasian Resources Group and China Molybdenum are piloting ReSource, a solution to track responsibly produced cobalt from mine to electric car.

• Northern America
  ○ USA: First Cobalt [11.5.21]
    ▪ First Cobalt announced on Tuesday that it has more than doubled the size of its land position surrounding the Iron Creek project in Idaho.
Copper

- **Global [19.5.21]**
  - Copper miners are taking another look at extracting value from their waste rock dumps, thanks to the record recent copper price rally and the application of new technology.

- **Asia**
  - **China [10.5.21]**
    - China’s major copper smelters have vowed to reduce purchases of concentrate this year as the country seeks to curb its carbon emissions, according to a state-run research firm.

- **Europe**
  - **UK: LME [14.5.21]**
    - London Metal Exchange cash copper prices hit the record level of US$10,725/t in nominal terms on 10 May 2021.

- **North America**
  - **Canada: Foran Mining [18.5.21]**
    - Foran Mining reports that its 100%-owned McIlvenna Bay is the world’s first carbon neutral copper development project.
Graphite

• Europe
  ○ Ukraine: Volt Resources [6.5.21]
    - Graphite and gold explorer and developer Volt Resources has provided an update on the progress of due diligence for the acquisition of a 70% interest in the Zavalievsky group of companies.
  ○ Norway: Superior Graphite [18.5.21]
    - Superior Graphite and Mineral Commodities entered into an exclusive non-binding MOU last month to form a 50:50 joint venture to purify natural graphite for use in lithium-ion battery anodes.

• North America
  ○ Canada: Green Battery Minerals [20.5.21]
    - Green Battery Minerals Inc announced plans to raise new funds to help exploration efforts at its promising Berkwood graphite project in northern Quebec.
Lithium

• Africa
  ○ DRC: AVZ Minerals [10.5.21]
    □ The recently sworn-in government of the Democratic Republic of Congo (DRC) has approved a draft inter-ministerial decree and draft cooperation agreement with Australia-based AVZ Minerals regarding the development of the Manono lithium-tin project.

• Europe
  ○ France: Eramet [11.5.21]
    □ Eramet SA announced on Tuesday it had extracted lithium from geothermal salt water in a pilot in eastern France.
  ○ UK: British Lithium [17.5.21]
    □ British Lithium has patent pending for sustainable process to extract lithium from granite.
    □ [https://www.proactiveinvestors.co.uk/companies/news/949745/british-lithium-has-patent-pending-for-sustainable-process-to-extract-lithium-from-granite-949745.html](https://www.proactiveinvestors.co.uk/companies/news/949745/british-lithium-has-patent-pending-for-sustainable-process-to-extract-lithium-from-granite-949745.html)

• Latin America
  ○ Mexico: Baconara Lithium [10.5.21]
    □ Major Chinese lithium producer Jiangxi Ganfeng is bidding to acquire Australian lithium development firm Bacanora Lithium, which operates the Sonora lithium project in Mexico.
Manganese

• Oceania
  ○ Australia: [28.5.21]
    ▪ A day after securing the sale of the first parcel of material from its Butcherbird manganese project in Western Australia, Element 25 Ltd has signed a letter of intent with AK Evans Group Australia for transportation of manganese concentrate.

• Europe
  ○ Czech Republic: Euro Manganese [19.5.21]
    ▪ Euro Manganese Ltd president and chief executive officer Marco Romero has outlined the company’s commitment to environmental, social and corporate governance (ESG) at the Chvaletice Manganese Project in the Czech Republic.

• North America
  ○ Canada: [3.5.21]
    ▪ Canadian Manganese Company Inc reports it closed the previously announced acquisition of Maximos Metal Corp and its previously announced private placement of subscription receipts raising gross proceeds of $5,947,500.
    ▪ [https://finance.yahoo.com/news/canadian-manganese-closes-acquisition-maximos-155100335.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbs8&guce_referrer_sig=AQAAAABe_iqX1vq2MMRF-9R5m3ZHCgdibRXsLJGhx3M40hpOxU1xW266TTVGq0Qhr3ShJ9WegD0iy9fzRhK565o0b3iKNhxOaNlWZ0VDir3AfTG-Ahqixczf46rmjNdWLrCK-hbWHx_JFlGw04eLAZfUkYcuxCyPPpFAVbFXKyCf_p](https://finance.yahoo.com/news/canadian-manganese-closes-acquisition-maximos-155100335.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbs8&guce_referrer_sig=AQAAAABe_iqX1vq2MMRF-9R5m3ZHCgdibRXsLJGhx3M40hpOxU1xW266TTVGq0Qhr3ShJ9WegD0iy9fzRhK565o0b3iKNhxOaNlWZ0VDir3AfTG-Ahqixczf46rmjNdWLrCK-hbWHx_JFlGw04eLAZfUkYcuxCyPPpFAVbFXKyCf_p)
Nickel

• Europe
  ○ Russia: Nornickel [19.5.21]
    - Nornickel has announced that it has recovered ore mining at the Oktyabrsky underground mine back to full capacity after floodwaters caused the operation to be partially suspended.

• Latin America
  ○ Brazil: Atlantic Nickel [12.5.21]
    - Atlantic Nickel has continued to ramp up its Santa Rita nickel-copper-cobalt mine in Brazil. The company announced that it had produced 26kt of nickel concentrate containing 3.6kt Ni along with 1.1kt Cu in Q1 2021.

• Oceania
  ○ Indonesia: Nickel Mines [7.5.21]
    - Australian group Nickel Mines Limited has signed an agreement to add a nickel matte production circuit to two of its existing rotary kiln electric furnace (RKEF) lines in Indonesia.

  ○ Indonesia: Legend Mining [19.5.21]
    - China’s Lygend Mining said on Wednesday its $1.05-billion nickel and cobalt smelting project in Indonesia had churned out its first batch of mixed hydroxide precipitate (MHP).
Tin

• Global [19.5.21]
  ■ Tin squeeze highlights critical minerals supply problems. Around half of all tin used globally goes into soldering circuit-boards, the hidden drivers of the electronic world, meaning it is everywhere but nowhere to be seen.

• Africa
  ○ Namibia: AfriTin [4.5.21]
    ■ AfriTin Mining has released the results of its Definitive Feasibility Study for the Uis Tin Mine. The DFS confirms the feasibility of expanding the current Phase 1 processing plant from 720 tonnes/year of tin concentrate to 1,200 tonnes.
    ■ https://www.internationaltin.org/afritin-uis-expansion-feasibility/
  ○ DRC: AVZ Minerals [18.5.21]
    ■ AVZ Minerals says a maiden placer tin exploration target of up to 75 million cubic metres of contained cassiterite grading between 75 and 180 grams per cubic metre at its Manono project in the Democratic Republic of Congo underlines the potential for a standalone tin mine at one of the world’s largest emerging hard-rock lithium projects.

• Oceania
  ○ Indonesia: PT Time [7.5.21]
    ■ Refined tin production from Indonesia’s PT Timah, one of the world’s top tin miners, fell 63.1% in the first quarter from the same period last year, the company said in a statement on Friday.
    ■ https://www.reuters.com/article/indonesia-tin-idUSL4N2MU0OK
Tungsten

• Asia
  ○ Thailand: Pan Asia Metals [29.4.21]
    ▪ Pan Asia Metals has wound up its priority exploration program across the Khao Soon tungsten project in Thailand with some solid drill hits of wide, rich, near-surface tungsten.

• Europe
  ○ UK: Tungsten West [16.5.21]
    ▪ Tungsten West, the owner of a historic tungsten mine in Devon, west England is preparing for a initial public offering on AIM with a GBP100 million valuation.
Rare Earth Elements

- **Global [7.5.21]**
  - A new report by Adamas Intelligence states that the market for magnet rare earth oxides is expected to increase fivefold by 2030 to $15.65 billion from the current $2.98 billion.

- **North America**
  - **Greenland [25.5.21]**
    - The EU’s plan to secure its supply of rare earth metals — vital for its green transition — is running into trouble in Greenland.

- **Oceania**
  - **Malaysia: Lynas Rare Earths [13.5.21]**
    - Australia’s Lynas Rare Earths will continue to operate its processing plant at Kuantan in Malaysia during a Covid-19 related Movement Control Order (MCO) imposed by the Malaysian government for 12 May-7 June.

  - **Australia: Iluka Resources [11.5.21]**
    - Australia has backed a new rare earths processing plant planned by mineral sands producer Iluka Resources, saying it is in line with a government effort to build supply of critical minerals.
The UK battery industry is expected to grow rapidly because of the electric vehicle (EV) boom, with experts predicting demand for up to seven gigaplants by 2040.

The government’s plan to bring forward its ban on internal-combustion engine vehicles to 2030 will lead to a large expansion in the battery industry as the country transitions to driving EVs, according to Stephen Gifford, chief economist at UK institute for electrochemical energy the Faraday Institution.

This acceleration in the UK’s plans adds urgency in the battery market and will drive up regional demand for battery metals and chemical derivatives of cobalt, lithium, nickel and manganese.

"As well as decarbonisation benefits of the electrification of automotive, the size of the economic opportunity for the UK is significant," Gifford told Argus.

"There is demand for seven UK gigafactories by 2040 and we forecast that the overall industry workforce of the EV and EV battery ecosystem would grow by 29pc from 170,000 in 2020 to 220,000 by 2040."
This, the 6th International Symposium on Sustainable Minerals (Sustainable Minerals '21), is the postponed Sustainable Minerals '20, which was affected by the Coronavirus outbreak.

It is organised by MEI in consultation with Prof Markus Reuter and is sponsored by FLSmidth.

Keynote lectures:

- The keynote lecture "Why mine closure should not be considered just an environmental issue" will be presented by Prof. Anna Littleboy, of the Cooperative Research Centre for Transformations in Mining Economies, Australia.

- The keynote lecture "A Life Cycle-Based, Sustainability-Driven Innovation Approach in the Minerals Industry" will be presented by Prof. Luis Marcelo Tavares, of the University of Rio de Janeiro.

- The keynote lecture "The war on waste: How could the mining industry respond?" will be presented by Dr. Anita Parbhakar-Fox, of the Sustainable Minerals Institute at the University of Queensland, Australia.
Globe Series: Circular Economy Virtual Event

10 June 2021
9:00 - 11:30 | 12:00 - 14:20 ET

Join us for a new event in the Circular Economy Solution Series and an official side event of the Industrial Circular Economy Conference

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