Technology Metals Report (10.04.2024): Energy Fuels Acquires Australia's Base Resources as Google Explores Nuclear Power for AI Data Centers

written by Tracy Hughes | October 4, 2024

Welcome to the latest issue of the **Technology Metals Report (TMR)**, brought to you by the **Critical Minerals Institute (CMI)**. In this edition, we compile the most impactful stories shared by our CMI Directors over the past week, reflecting the dynamic and evolving nature of the critical minerals and technology metals industry. Among the key stories featured in this report are Google's exploration of nuclear power for its AI-driven data centers, a strategic U.S.-India agreement on battery mineral supply chains, and the Saskatchewan Research Council's challenge to China's dominance in rare earth processing. These stories, listed chronologically, offer insight into the shifting landscape of critical minerals and the challenges and opportunities that lie ahead for the sector.

This week's TMR Report also highlights Vale's investment in Brazil's inaugural critical minerals fund, Japan's renewed focus on nuclear energy and renewables, and Energy Fuels Inc.'s (NYSE American: UUUU | TSX: EFR) acquisition of Australia's Base Resources Limited (ASX: BSE), strengthening the U.S. supply chain for rare earths. Additionally, the Critical Minerals Institute welcomes Harry Kim to its Board of Directors, underscoring CMI's commitment to ESG and sustainability. Each of

these developments demonstrates the increasing importance of strategic collaborations and technological advancements in securing the future of critical minerals. To become a CMI member, click here

Google considers sourcing from nuclear power plants, says CEO Pichai (October 3, 2024, Source) – Google is exploring nuclear power as an energy source for its data centers to support intensive energy demands from its AI projects, CEO Sundar Pichai disclosed in an interview. The company aims to intensify its investment in carbon-free power sources, including solar and thermal power, aligning with its goal to achieve net-zero emissions by 2030. Despite a 48% increase in greenhouse gas emissions since 2019 due to its generative AI, Google remains committed to its ambitious emissions target. Pichai highlighted the early, heavy investment in AI as typical for significant technological shifts, emphasizing efficiency gains over time. Google's exploration includes small modular nuclear reactors among other technologies. This comes as competitors like Amazon and Microsoft also turn to nuclear power, with Microsoft recently contracting with the Three Mile Island plant in Pennsylvania.

India, US sign pact to cooperate on critical battery mineral supply chains (October 3, 2024, Source) – India and the U.S. have signed a memorandum of understanding (MOU) to enhance cooperation on the supply chains for critical minerals like lithium and cobalt, essential for electric vehicles and clean energy applications. The agreement was signed by Indian Trade Minister Piyush Goyal and U.S. Commerce Secretary Gina Raimondo during Goyal's visit to Washington. This partnership aims to strengthen sector resilience by focusing on areas such as exploration, extraction, processing, refining, recycling, and recovery of critical minerals. The MOU envisions a multi-dimensional partnership involving open supply chains, technology

development, and investment flows to boost green energy. It also includes potential collaboration with third countries in mineral-rich regions like Africa and South America. However, the agreement does not extend to a full critical minerals trade deal needed for India to benefit from the U.S. electric vehicle tax credit, unlike a similar deal between the U.S. and Japan.

Saskatchewan faces major obstacles as it aims to compete with China in processing rare earth minerals (October 2, 2024, Source) – The Saskatchewan Research Council (SRC) is venturing into challenging China's stronghold on the rare earth minerals market by establishing North America's first rare earths processing plant in Saskatoon. The plant focuses on vital elements like neodymium, praseodymium, and samarium, pivotal for technology, defense, and low-carbon industries. Despite China's dominance in refining, controlling over 95% of the market, SRC is determined to secure North American autonomy over these essential resources. The SRC plans to scale up its production capabilities, with the goal of meeting significant demands from the U.S. Department of Defense among others. However, Jack Lifton from the Toronto-based **Critical Minerals Institute (CMI)** cautions that the SRC faces substantial hurdles. He emphasizes the uniqueness of the rare earths market, where products are custom-made for specific clients, necessitating highly specialized manufacturing processes. Overcoming these market and operational challenges is crucial for the plant's commercial success.

Vale Backs Brazil Critical Minerals Fund in Nod to Government (October 2, 2024, Source) – Vale SA, the world's second-largest iron ore supplier, is investing in Brazil's inaugural fund to support critical minerals, signaling a strategic pivot towards diversifying its predominantly iron-based revenue. CEO Gustavo Pimenta, who recently assumed leadership, highlighted the importance of advancing critical mineral projects to commercial

viability. The fund, a collaboration between Vale and Brazil's development bank BNDES, totals 1 billion reais ($184 million) and is managed by a consortium including JGP Asset Management, BB Asset, and Ore Investments. This initiative will fund 20 junior and mid-sized companies focused on the research, development, and implementation of strategic mineral projects in Brazil. Vale's commitment also extends to restoring governmental relations and addressing historical challenges, such as the 2015 mining disaster and expanding production capacities.

Japan to keep nuclear, boost renewables in its energy mix, new industry minister says (October 2, 2024, Source) – Japan's Industry Minister, Yoji Muto, announced that the country will continue to restart nuclear power plants safely and maximize renewable energy usage. This statement reflects the energy policy direction under Prime Minister Shigeru Ishiba, who has modified his previous stance against nuclear power. Initially, Ishiba was the only candidate advocating for an end to nuclear energy in Japan, a country heavily reliant on imported fossil fuels. However, he shifted his position before taking office, now emphasizing renewable energy and energy conservation instead of completely eliminating nuclear power. Renewable sources like solar, wind, and hydropower constituted over a quarter of Japan's energy last year, with nuclear energy providing 9%. Despite the devastating 2011 Fukushima disaster, Japan operates eleven nuclear reactors, contributing significantly to reducing its reliance on expensive imported fuels. The future political dynamics and upcoming elections will likely influence the ongoing discussions about nuclear energy in Japan.

U.S. Rare Earths and Critical Minerals Supply Chain Bolstered as Energy Fuels Completes Acquisition of Australia's Base Resources (October 2, 2024, Source) – Energy Fuels Inc. (NYSE American: UUUU | TSX: EFR) has bolstered the U.S. supply chain for rare earths and critical minerals by acquiring Australia's Base

Resources Limited (ASX: BSE) for approximately US$178.4 million. This acquisition enhances Energy Fuels' position in the global market, aligning with its goal to establish a comprehensive U.S. rare earth supply chain. The company gains access to the Toliara Project in Madagascar, a significant source of rare earth minerals, titanium, and zirconium, which will be processed at its White Mesa Mill in Utah—the only facility in the U.S. capable of such operations. This strategic move is vital for reducing U.S. reliance on foreign minerals, crucial for clean energy and national defense technologies. Energy Fuels now also advances in the titanium and zirconium markets, reinforcing its role in supporting future clean energy initiatives.

Critical Minerals Institute (CMI) Announces Harry Kim's Appointment to the Board of Directors, Strengthening Leadership in ESG and Sustainability (October 2, 2024, Source) – The **Critical Minerals Institute (CMI)** has announced the appointment of Harry H. Kim, P.Eng., to its Board of Directors. Harry brings over 30 years of experience in global environmental consulting and contracting, particularly in ESG, sustainability, and strategic risk management within the mining, energy, and infrastructure sectors. His extensive international experience spans environmental and reputational risk management across entire project lifecycles, including Environmental Impact Assessments, community engagement, and corporate social responsibility. Harry Kim's addition is anticipated to significantly bolster CMI's commitment to sustainability and responsible practices in the critical minerals sector. His role will be crucial in scaling natural resource operations sustainably and meeting stakeholder expectations in ESG issues, as stated by both Harry and Tracy Hughes, Executive Director of CMI.

CME expands lithium futures battle with LME as battery demand soars (September 30, 2024, Source) – CME Group has intensified

its competition with the London Metal Exchange by launching spodumene futures, targeting the booming battery metal market spurred by rising electric vehicle (EV) demand. Spodumene, a lithium-rich rock and key source of lithium chemicals for EV batteries, marks a new trading frontier, previously dominated by processed lithium forms like hydroxide and carbonate. As the largest producer of spodumene, Australia stands to benefit significantly. This move by CME, aiming for an October 28 launch pending regulatory approval, underscores a strategic expansion in battery metal futures, with spodumene prices influencing downstream lithium chemical prices. The evolution of lithium trading, paralleled by industry shifts seen in iron ore, signals a potential transformation into a more derivative-focused market, highlighting the growing strategic importance of lithium in global commodity exchanges.

Secretary Antony J. Blinken and Norwegian Foreign Minister Espen Barth Eide at the Signing of a Memorandum of Cooperation on High-Standard, Market-Oriented Trade of Critical Minerals (September 30, 2024, Source) – Secretary Antony J. Blinken and Norwegian Foreign Minister Espen Barth Eide signed a Memorandum of Cooperation to enhance the trade of critical minerals, focusing on maintaining high standards and market-oriented approaches. This agreement underscores the commitment of the U.S. and Norway, both founding NATO members, to bolster economic and national security through sustainable and transparent critical mineral supply chains, essential for achieving global clean energy objectives. The partnership extends beyond bilateral relations to address regional and global issues, including decarbonization and climate change mitigation. The MOU is part of a broader effort involving multiple nations through the Mineral Security Partnership, aimed at increasing investment in global supply chains to meet the burgeoning demand for critical minerals necessary for the 21st century clean energy

economy.

BHP expects copper demand to grow by 1 mln metric tons a year until 2035 (September 30, 2024, Source) – BHP Group Ltd. (ASX: BHP | NYSE: BHP), the Australian mining giant, projects that global copper demand will increase by an average of 1 million metric tons annually until 2035, driven by the adoption of technologies that heavily utilize copper. This marks a significant rise compared to the growth experienced over the past 15 years. Copper's primary applications in construction, transport, and power are expanding to include electric vehicles, green energy, and data centers. Despite a historical slowdown in demand growth—from a 3.1% compound annual growth rate over the past 75 years to just 1.9% from 2006 to 2021—BHP anticipates a rebound to 2.6% per year moving forward. By 2050, BHP expects a 70% surge in copper demand, reaching 50 million tons annually, catalyzed by the energy transition and digital sectors. This forecast is set against a backdrop of challenges in mining output, such as rising costs and declining ore grades, with substantial investments anticipated in expansion capital expenditures.

Freeport cranks up copper output as rivals scour for deals to grow (September 29, 2024, Source) – Freeport-McMoRan (NYSE: FCX) is ramping up copper production across three continents, choosing to focus on expanding its current assets rather than pursuing acquisitions, unlike many of its industry peers. The company is well-positioned to benefit from the rising demand for copper, driven by the clean energy transition. Freeport plans to produce 800 million pounds of copper annually by 2027 using a low-cost leaching process on waste rock, which is more economical than traditional mining. Additionally, it has multiple expansion projects underway, including the Grasberg mine in Indonesia. With copper demand expected to increase 60% by 2050, Freeport's strategy of focusing on existing operations

rather than costly buyouts has attracted investor confidence, with its stock rising 30% over the past year. CEO Kathleen Quirk emphasizes creating value through existing assets and strengthening relationships with key global partners.

The Fall of the American Automotive Industry and the Missteps that Drove Us Here (September 29, 2024, Source) – The decline of the American automotive industry is linked to strategic missteps in supply chain management. Originally, companies like General Motors employed robust in-house teams to manage crucial metal purchases for vehicle manufacturing, a method initiated by Henry Ford's vertical integration strategy. By the late 20th century, however, U.S. automakers had shifted focus toward short-term profitability, moving away from integrated supply chains—a practice still valued by European competitors who balanced it with social priorities. This strategic divergence rendered American companies less competitive against foreign automakers who offered more affordable and innovative vehicles. The current U.S. industrial policies are insufficient in the face of globalization challenges. Outdated strategies and protectionist measures are ineffective against a market dominated by Chinese advancements in critical minerals and trade, indicating a need for systemic overhaul.

Investor.News Media Highlights:

- October 2, 2024 – U.S. Rare Earths and Critical Minerals Supply Chain Bolstered as Energy Fuels Completes Acquisition of Australia's Base Resources https://bit.ly/4gRiRsE
- October 2, 2024 – Critical Minerals Institute (CMI) Announces Harry Kim's Appointment to the Board of Directors, Strengthening Leadership in ESG and Sustainability https://bit.ly/3ZIrYWB

- September 30, 2024 – Australian Strategic Materials Emerges as a Frontrunner in the Critical Minerals Race with Major 2024 Milestones Achieved https://bit.ly/3TQpEca
- September 29, 2024 – The Fall of the American Automotive Industry and the Missteps that Drove Us Here https://bit.ly/47JvGRO
- September 29, 2024 – ArcStone Kingswood Growth Summit Ignites Bay Street, Unveils Global Expansion with ArcStone Israel Launch https://bit.ly/3ZCZL3s

Investor.News Member News:

- October 3, 2024 – Power Nickel Announces Biggest Intersection Yet – Major Advancements at the Lion Zone! https://bit.ly/3N8pHfM
- October 2, 2024 – First Phosphate Reports Published University Research Note Relating to Igneous Rock Phosphate Ore Bodies around the World https://bit.ly/3Y5nd8m
- October 2, 2024 – US Rare Earth and Critical Mineral Supply Security Significantly Boosted as Energy Fuels Closes Acquisition of Australia's Base Resources https://bit.ly/3Y62OzM
- October 2, 2024 – Retirement of Non-Executive Director Mr. Geoffrey Hill and appointment of Non-Executive Director Mr. Hugh Keller https://bit.ly/3zxEUnD
- October 1, 2024 – Western Uranium & Vanadium Acquires Property to Advance Milling Strategy https://bit.ly/4eC4o1Y
- October 1, 2024 – American Rare Earths Drilling Results Confirm Higher Grade Extending to the West Cowboy State Mine Area https://bit.ly/4gPlCuq
- October 1, 2024 – Nano One Announces Resignation of Paul

Matysek and Appointment of Industry Veteran Anthony Tse as New Chair of the Board of Directors https://bit.ly/4emnrO3

- October 1, 2024 – Power Nickel Announces New Assay Results from its Polymetallic Lion Zone Discovery https://bit.ly/47VMtkM
- October 1, 2024 – Panther Metals Ltd Holding Update https://bit.ly/3BuUscs
- October 1, 2024 – Replacement 2024 Annual Report https://bit.ly/3ZN3Ty2
- September 30, 2024 – Coniagas Battery Metals Completes Private Placement https://bit.ly/4eCamjy
- September 30, 2024 – Australian Strategic Materials Ltd. Annual Report to shareholders https://bit.ly/4eosBJt
- September 30, 2024 – Panther Metals PLC Half Yearly Financial Report For the Six Months Ended 30 June 2024 https://bit.ly/4drzSH7