

Breaking the CMI Critical Minerals List 2025: A Strategic Blueprint for Global Technology, Defense, and Economic Security

written by Tracy Hughes | April 9, 2025

*“Selecting the **CMI Critical Minerals List 2025** was like devising a strategic battle plan for the world’s future tech infrastructure. We focused on minerals that, if disrupted, could cripple entire industries overnight—whether through geographic choke points, lack of viable substitutes, or surging demand curves. Copper, beryllium, uranium, and others aren’t optional extras; they’re the foundation of our global competitiveness and national resilience.” – Alastair Neill, P. Eng., MBA, President, Trinity Management Ltd. & Director, [Critical Minerals Institute \(CMI\)](#)*

The **Critical Minerals Institute (CMI)** has just announced its long-awaited **CMI Critical Minerals List 2025**, spotlighting 23 minerals that underpin the technological, economic, and strategic imperatives of a rapidly evolving world. This list emerges from extensive scrutiny of a dozen critical minerals lists worldwide, representing major economies and alliances such as the United States, Canada, Australia, New Zealand, the United Kingdom, Europe, India, Japan, South Korea, and NATO. With 55 distinct minerals identified across these global lists, the CMI’s selection zeroes in on those appearing in at least 7 out of the 12 lists monitored—an evidence-based approach designed to highlight the most indispensable resources for the imminent

future.

Yet this unveiling is not solely about numbers and consensus; it reflects an urgent call for international collaboration in building resilient, sustainable supply chains—underscored by the resounding message of CMI leaders. As **Tracy Hughes**, Founder & Executive Director of CMI, asserts:

“As we convene for CMI Summit IV, the stakes have never been higher—collaboration across industries and borders is no longer optional, it’s imperative. We must act decisively to build resilient, sustainable critical mineral supply chains, or risk losing our technological and economic future.”

The Global Context: Why Critical Minerals Matter

Critical minerals lie at the nexus of national security, economic growth, and environmental sustainability. Their relevance spans advanced electronics, defense systems, green energy infrastructure, and more. Whether it is rare earth elements (REEs) central to high-performance magnets or uranium’s role in zero-emission nuclear power, each mineral on the CMI list fulfills an indispensable function.

Since 2020, the number of officially recognized “critical” or “strategic” minerals has expanded worldwide, pointing to an escalating awareness of the vulnerabilities embedded in global supply chains. China’s outsized role in refining and producing several of these minerals has amplified concerns about potential disruptions or monopolies. **Melissa ‘Mel’ Sanderson**, Director, American Rare Earths Limited (ASX: ARR | OTCQX: ARRNF) & Co-Chair, Critical Minerals Institute (CMI), captures the sentiment perfectly:

“The Minerals Security Partnership underscores how urgently we need global cooperation—no single nation can swiftly break China’s dominance alone. Unless we unite resources, technology, and political will, we risk handing control of our critical mineral future right back to Beijing.”

Moreover, there is a growing demand not only to *obtain* these minerals but also to do so responsibly, minimizing environmental harm and ensuring ethical labor practices. This dual mandate—securing supply while upholding sustainability—further complicates the landscape. When journalists, policymakers, and experts fail to grasp the underlying complexities, the repercussions can be severe. As **Jack Lifton**, Co-Chair of [CMI](#), succinctly warns:

“The pervasive scientific illiteracy among journalists, policymakers, and credentialed ‘experts’ isn’t just misleading—it’s dangerous. Without addressing this fundamental ignorance, we risk making uninformed decisions that threaten our economic security and technological future.”

The Lists That Shape Global Perspective

CMI [tracks](#) a total of 12 critical-mineral-related lists from around the globe under the guidance of critical minerals expert **Alastair Neil**, reflecting diverse geopolitical and economic vantage points:

1. USA DOE Critical Minerals List (2023)

2. USA USGS Critical Minerals List (2022)
3. Canadian Critical Minerals List (2024)
4. Australian Critical Minerals List (2024)
5. Australian Strategic Materials List (2024)
6. New Zealand Critical Minerals List (2025)
7. UK Critical Minerals List (2022)
8. European Critical Minerals List (2023)
9. NATO Critical Minerals List (2024)
10. Japanese Critical Minerals List (2020)
11. South Korea Critical Minerals List (2023)
12. India Critical Minerals List (2023)

From these lists, CMI identified 55 minerals that at least one jurisdiction deems “critical” or “strategic.” These include minerals crucial for everything from semiconductors (e.g., gallium, germanium) to aerospace engineering (e.g., titanium, beryllium) and from energy storage (lithium, cobalt) to green energy infrastructure (rare earth elements, copper).

However, not all 55 minerals are equally pressing in the eyes of [CMI](#). To distill and highlight those that are most urgently needed, the Institute adopted a clear criterion: each mineral had to appear on at least 7 out of these 12 lists. Through this rigorous process, 23 minerals emerged as the most crucial for 2025.

CMI Critical Minerals List 2025 Selection Criteria

The logic underlying this refined list goes beyond simple tallies. According to Alastair Neill, Director at the CMI and the lead architect of the new **CMI Critical Minerals List 2025**, three principal considerations guide the designation of a mineral as “critical”:

1. Dominant Control by One or Two Countries

When a small number of nations holds the majority of global supply—or, just as crucially, the capacity to process that supply—market vulnerabilities can become acute. As Neill explains, *“One would be [the risk of] dominant control by one or two countries for global supply, such as China’s dominance in rare earth elements and downstream manufacturing.”*

2. Lack of Substitutes

A mineral becomes indispensable when no viable alternatives exist in industrial or technological applications. Neill highlights beryllium as a prime example: *“Beryllium is one of those that should go on the list because there is really no substitute. Not everybody recognizes that, but it is crucial in certain high-performance applications.”*

3. Future Supply–Demand Tensions

The final selection criterion anticipates future trends. Even if present-day stocks appear adequate, shifting demand for electrification, decarbonization, and defense can render certain minerals critical. *“We picked a couple that are not high on lists globally—uranium and copper—but when you look down the road at electrification, the demand–supply dynamics are going to change,”* notes Neill. These will only intensify as older mines degrade in quality or deplete, while new projects face regulatory and financial hurdles.

The Official CMI Critical Minerals List 2025

Based on both quantitative data (how often each mineral appears on global lists) and qualitative insights (dominant supply

chains, lack of substitutes, impending demand–supply imbalances), the **CMI Critical Minerals List 2025** list names the following **23** minerals:

1. Aluminum (Al), Bauxite, High-Purity Alumina (HPA)
2. Antimony (Sb)
3. Beryllium (Be)
4. Bismuth (Bi)
5. Cobalt (Co)
6. Copper (Cu)
7. Gallium (Ga)
8. Germanium (Ge)
9. Graphite, (Carbon – C)
10. Indium (In)
11. Lithium (Li)
12. Magnesium (Mg)
13. Manganese (Mn)
14. Nickel (Ni)
15. Niobium (Nb)
16. Platinum Group Metals (PGMs)
17. Rare Earth Elements (REEs)
18. Silicon (Si), Silicon Metal
19. Tantalum (Ta)
20. Titanium (Ti), Titanium Metal
21. Tungsten (W)
22. Uranium (U)
23. Vanadium (V)

CMI's Top Five to Watch

1. **Copper:** As the backbone of electrification, copper demand is projected to surge in tandem with electric vehicles, renewable energy grids, and high-speed data

infrastructures. Existing mines are facing grade depletion, and large-scale new projects may lag behind market needs.

2. **Uranium:** A linchpin of nuclear energy, uranium is poised for renewed relevance as nations seek low-carbon baseload power. The advent of small modular reactors further intensifies long-term demand, even if near-term prices do not always reflect this potential.
3. **Gallium:** Widely employed in semiconductors and optoelectronics, gallium is essential for advanced devices. With limited global producers, supply disruptions could have profound consequences for high-tech industries.
4. **Rare Earth Elements (REEs):** Critical to everything from wind turbines to defense technology and electric vehicles, REEs remain the epitome of a concentrated supply chain, overwhelmingly dominated by China's extraction and processing capabilities.
5. **Cobalt:** Integral to high-performance lithium-ion batteries powering electric vehicles, cobalt's demand is steadily increasing. Despite efforts toward reducing cobalt usage and developing alternative battery chemistries, its superior energy density and thermal stability ensure that cobalt remains a pivotal element in battery technology, keeping supply chain concerns and ethical sourcing firmly in the spotlight.

The Stakes for Industry and Policy

The ramifications of this list are broad and multifaceted. For private-sector stakeholders, awareness is the first step: companies reliant on any of these 23 minerals for manufacturing, research, or product development must gauge their exposure to supply risks. Strategic planning—whether through diversifying

supplier relationships, investing in local extraction or recycling, or developing stockpiles—can prove decisive in maintaining a competitive edge.

For policymakers, the call to action is equally clear. A “critical” designation often paves the way for legislation, targeted funding, and international agreements. As governments worldwide intensify their focus on securing these materials, collaboration with industry will become essential to avoid duplication, manage environmental footprints, and uphold ethical sourcing standards.

Meanwhile, the crucial bridging role that journalists, analysts, and academia play cannot be overstated. In an era where public sentiment can rapidly shape policy directions, ensuring a scientifically accurate and nuanced narrative is vital. **Lifton’s** admonition about “pervasive scientific illiteracy” underscores that misinformation is not merely a communications blunder; it is a strategic vulnerability with real economic and security consequences.

The Imperative for International Coordination

The concept of “critical minerals” is, by definition, an international concern. Any single country’s success in ensuring its mineral supply can be undermined by disruptions that reverberate across global supply chains. Multinational pacts such as the Minerals Security Partnership—and summits like the **CMI Summit** series—offer platforms for sharing knowledge, technology, and project financing. They also foster unity against attempts to monopolize mining and processing or to weaponize resource trade.

Collaboration includes co-investment in new projects, harmonizing safety and environmental standards, and accelerating the development of alternative extraction and recycling technologies. This multilateral approach reduces geopolitical risks and can ease the path toward more sustainable extraction, which many investors and consumers now demand.

Looking Ahead: Opportunities and Challenges

The unveiling of the **CMI Critical Minerals List 2025** is both a wake-up call and an opportunity. As the international community grapples with post-pandemic reconstruction, energy transitions, and intensifying technological competition, safeguarding reliable access to key minerals has never been more urgent.

By distilling insights from 12 global lists, [CMI](#) provides a streamlined, authoritative view of which minerals most urgently require investment, innovation, and strategic policy support. The Institute's list balances immediate considerations—such as existing supply-chain choke points—with forward-looking concerns about geopolitical tensions, sustainability targets, and unstoppable trends like electrification and digital expansion.

Alastair Neill, who led the list's creation, emphasizes that this is a living roadmap rather than a final decree. *“Another reason is it's critical if there is no substitution,”* he points out, highlighting minerals like beryllium that, while not universally recognized, are indispensable in certain applications. He adds, *“We picked a couple that are not high on lists globally—uranium and copper—but when you look down the road at electrification, the demand–supply dynamics are going to change.”*

Taken collectively, these insights should prompt governments, companies, and investors to act decisively. From building domestic refining capacity to forging new trade agreements, the strategic alignment around critical minerals can stimulate innovation, create jobs, and contribute to global economic stability. In other words, the next five to ten years will set the tone for how effectively the international community collaborates to mitigate risk and secure the minerals that fuel our modern world.

Conclusion: A Call to Strategic Engagement

The **CMI Critical Minerals List 2025** is more than an inventory; it is a clarion call. With 23 minerals identified as essential for maintaining economic competitiveness, national security, and technological leadership, the stakes could hardly be higher. The voices of [CMI](#) leadership—including Executive Directors Tracy Hughes and Alastair Neill, Co-Chairs Melissa Sanderson and Jack Lifton, and Directors Christopher Berlet, Christopher Ecclestone, Christopher Gibbs, Geoff Atkins, Kevin Ernst, Kiana Kianara, Peter Clausi, Peter Cashin, Russell Fryer, Stephen Burega, Stephen Lautens, Thomas Kruegger, Tuan Tran, and Assistant Editor & Publisher Raj Shah—resonate with urgency, underscoring the need for transnational cooperation, informed policy decisions, and deeper scientific literacy.

“The stakes have never been higher,” warns Hughes. “We must act decisively, or risk losing our technological and economic future.” The path forward demands coordinated policy frameworks, strategic investments, and a collective commitment to responsible sourcing. This list serves not as a lament over vulnerabilities but as a strategic guide to building resilience. In a global landscape fraught with uncertainty, the capacity to

secure a stable supply of these 23 critical minerals may well dictate the arc of economic and geopolitical influence for decades to come.

For more information on the [Critical Minerals Institute](#) (CMI) or to find out more about the upcoming CMI Summit IV, [click here](#)

A promotional banner for the CMI Summit IV. The background features a large F-35 fighter jet flying over a smaller one, set against a dramatic sky with clouds and a bright sun. The banner is divided by a diagonal yellow line. On the left side, the CMI logo is prominently displayed in white, with the text 'Critical Minerals INSTITUTE' and 'CMI SUMMIT IV' below it. On the right side, the title 'The War for Critical Minerals and Capital Resources' is written in large white letters. Below the title, the location 'Toronto, ON' and dates 'May 13-14, 2025' are listed in yellow, followed by the website 'CriticalMineralSummit.com' in yellow. A circular seal in the bottom right corner reads 'CRITICAL MINERALS INSTITUTE', 'CMI', 'OFFICIAL MEMBER', and '★2025★'.