International Copper Association

Spotlight on Copper: **2023**

ICA ANNUAL REPORT

Former International Copper Association (ICA) President Anthony "Tony" Lea reflects on the organization's major developments in 2023, including the launch of *Copper—The Pathway to Net Zero* and ICA's expanding work in India.

25 YEARS of service

Thank You, Tony Lea

Tony Lea retired after 9 years as ICA's president and 25 years with the organization. During his tenure, he oversaw the development of some of ICA's most notable achievements, including the development and launch of The Copper Mark® and the industry's decarbonization roadmap, *Copper—The Pathway to Net Zero*. Behind the scenes, Tony worked tirelessly to serve the needs of the Board and members while supporting ICA's expert staff. ICA's membership and staff are grateful for his years of service and strategic leadership.

TONY LEA
ICA President
(2015 - 2023)

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Tony has **guided ICA through an important period of transformation for the copper industry**, and the Board thanks him for his leadership.

—Shehzad Bharmal, Chair of the Board of ICA and SVP, Base Metals, Teck Resources Limited

ICA Membership

6
operating continents

50%
of the world's copper production

32
members

AngloAmerican
Antofagasta Minerals
Antucoya Antofagasta Minerals
Centinela Antofagasta Minerals
Los Pelambres Antofagasta Minerals
Zaldívar Antofagasta Minerals
Aurubis
BHP
Boliden
Buenavista del Cobre
Codelco
Collahuasi
Freeport-McMoRan
Glencore
GrupoMexico
Ivanhoe Mines
JX Nippon Mining & Metals
KGHM Polska Miedź
LS MnM Metals & Materials
Metso:Outotec
Antamina
Minera Escondida
Mitsubishi Materials
RioTinto
El Abra
Cerro Verde
Southern Copper Southern Peru
Sumitomo Metal Mining
Teck
Vale

Newmont™

ICA welcomes Newmont to the International Copper Association

Newmont Corporation, headquartered in Denver, Colorado, is one of the world's leading producers of copper and gold, with 10 operations spanning 4 continents. Newmont has more than 100 years of history and is committed to creating value and improving lives through sustainable and responsible mining.

ICA Activities: By the Numbers

ICA chaired, moderated or spoke at 176 events in 2023

WATCH THE RECORDINGS

- *Critical Minerals—The Building Blocks of Decarbonization at the Concordia Annual Summit*
- *The Future of Substitution at the CRU World Copper Conference*
- *Unlocking Building Efficiency*

READ THE EVENT REPORTS

- *COP28: What does COP28 Mean for the Copper Industry?*
- *FT Mining Summit: The Role of Mining in the Circular Economy*
- *Climate Week NYC: Key Themes for Critical Minerals*
- *Concordia Annual Summit 2023: Building Blocks of Decarbonization*
- *CRU World Copper Conference: Exploring Substitution and Miniaturization Trends in Copper Demand*

10
Infographics and Brochures

15
Position Papers and Public Advocacy Letters

7
Peer-reviewed Academic Articles

18
Op-eds, Thought Leadership Articles and Member Case Studies

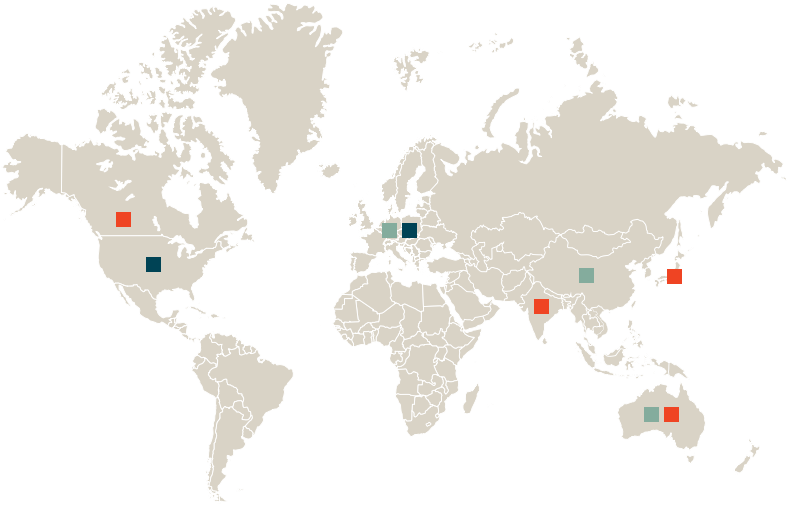
14
Newsletters

6
Newly Commissioned Studies or Research Presentations

Critical Minerals

The concept of critical minerals has grabbed global attention, but the meaning of "critical mineral" differs from government to government. Whether classified as a critical mineral, critical material or strategic material, each country or region maintains its own list based on supply and demand dynamics and requirements for national security, trade and technology. These lists change over time based on a country's perceived future needs.

CRITICAL MINERAL . CRITICAL MATERIAL . STRATEGIC MATERIAL/STRATEGIC RAW MATERIAL



Australia maintains two lists of minerals considered important for modern technologies, economy and national security: a critical minerals and strategic materials list. The country added copper to its Strategic Mineral list in 2023, which means copper was deemed important to the global transition to net zero, had geological presence in Australia and was in demand from international partners but did not meet the more stringent supply criteria for the country's critical minerals list.

Canada's definition of a critical mineral centers on the mineral's necessity to Canada's economic growth. Critical minerals must have a limited and/or concentrated supply in a few countries and have importance to energy and national security. Canada produces over 60 minerals domestically, including copper, which remains on the country's critical minerals list.

China's central government is still developing its policy on critical and/or strategic minerals. Ten provincial governments have drafted mineral resource plans for 2021 – 25.

In November 2023, the **EU** reached a provisional agreement on a European Critical Raw Materials Act. Critical raw materials (CRMs) are raw materials of high economic importance for the EU, with a high risk of supply disruption due to their concentration of sources and lack of good, affordable substitutes. Copper is currently categorized as both a critical and strategic material.

India announced its first-ever critical minerals list in 2023, consisting of 30 minerals deemed vital to the country's economy. Ensuring a reliable value chain for these minerals is a priority. This list includes copper.

Japan has over 30 minerals on its Critical Mineral list and is working on strengthening the resilience of its supply chains through agreements with core trading partners, such as the U.S. Japan is the largest consumer of rare earth elements, outside of China.

The **United States** Geographical Survey uses "data-driven, scientific investigations" to determine its Critical Minerals list, which as of December 2023 did not include copper. However, the U.S. Department of Energy released its own Critical Materials list based on an assessment of materials it views as critical or near critical to the energy sector through 2035. Copper appears on this list.

Program Updates

Clean Energy Transition

- The International Copper Association was the only global organization to work with the **China National Development and Reform Commission** on its first national guidance document focused on upgrading and renovating equipment, such as electric motors, transformers, refrigeration and home appliances.
- Sixty percent of India's petrol consumption and corresponding carbon emissions come from two- and three-wheelers, a segment dominated by internal combustion engines. ICA India partnered with one provincial government to develop a **retrofit program for three-wheelers**, demonstrating the feasibility of a copper-intensive retrofit solution based on battery swapping ("battery as a service").
- The **EU Emission Trading System** proposed new rules that would have led to a reduction of free emission allowances for copper smelters, refiners and fabricators between 2026 – 2030. The European Copper Institute worked with ICA members and other impacted sectors to oppose the most harmful provisions, instigating a change that will significantly alleviate the cost impact for installations with high process emissions.
- The **Electric School Bus Coalition**, founded by the Copper Development Association, continues to help school districts across the U.S., including those in cold weather regions and on rural routes, better understand the technology, funding and deployment of electric school buses. Electric school buses have been delivered or are operating in 46 states, bringing the number of students riding in zero emission school buses to over 98,000.

Global Partnerships

- ICA enjoyed a record 10 speaking engagements at **COP28** in Dubai. The launch of the Global Renewables and Energy Efficiency Pledge, which was endorsed by 130 countries was encouraging, and ICA contributed to the language on energy efficiency. The topic of critical minerals was high on the COP28 agenda, which provided an opportunity for ICA to advocate for copper.
- To date, the **Cornerstone of Rural Electrification (CORE)** has partnered with local governments and universities to deliver 15 training courses to more than 1,500 people in 12 countries in Africa, Asia and Latin America. More than 80 people are now qualified to train and certify energy practitioners. CORE puts ICA and its members at the nexus of energy access and efficiency while making a positive impact on local communities.
- 2023 saw advancement for **ICA's newest partnerships on energy efficiency**, the Grid Efficiency and Resilience (GEAR) project in Zambia and the Motor Efficiency Global Alliance (MEGA). Concept notes for Zambia's electrical grids through GEAR and an energy-efficiency project for the mining sector in Chile were developed for the Mission Efficiency Marketplace to evaluate. The Marketplace was created by ICA to scale investments in energy efficiency, which now proudly has more than two dozen partners.

Strategic Communications

- The Strategic Communications team led the launch of ***Copper—The Pathway to Net Zero***, which highlights members' plans to reach net zero by 2050. Launch materials encompassed a panel discussion in Brussels, articles in top-tier publications, a supportive video by UNEP Director, Inger Andersen, and an award-winning thought leadership video series
- This year's **Circular Copper campaign** took an educational approach, demonstrating the industry's role in advancing circularity, highlighting copper's inherent properties and sharing copper's role as an enabler of circular systems. Campaign elements focused on innovative technologies by "making the invisible visible," giving the viewer an inside look at circular systems. The launch video alone reached 352k people who viewed the content more than 987k times.
- ICA sponsored a panel at Concordia's Annual Summit in New York last September. The panel entitled, "**Critical Minerals: The Building Blocks of Decarbonization**," included the Copper Development Association's President, Andy Kireta Jr., as well as leaders from Rio Tinto, the Business Council for Sustainable Energy and Volvo, giving ICA the opportunity to discuss copper's vital role in a green future to a global audience.
- ICA China completed an effective campaign centered on green development. The campaign's social component garnered more than 16.6k engagements, a 43 percent increase over ICA China's typical WeChat engagement rate. The campaign's booth at the **Industrial Green Development Exhibition and Conference** reached 2k visitors.

Green and Healthy Buildings

- ICA assisted the **Sichuan Department of Housing and Urban-Rural Development** to develop a PEDF (Photovoltaic, Energy Storage, Direct Current, Flexibility) system standard handbook covering items such as short-circuit current calculation and energy storage system capacity. The draft was submitted for approval and is expected to be issued in 2024.
- The final agreement on a revision of the **Energy Performance of Buildings Directive (EPBD)** includes several provisions recommended by the European Copper Institute. The EPBD will drive building renovation in Europe, including the deployment of solar energy, heat pumps and charging points for electric vehicles.
- As a result of recurrent electrical accidents in Mumbai, ICA India participated in an expert committee established by the Maharashtra government to draft a **report emphasizing the need for electrical safety engineers**, building inspection and stringent adherence to national codes, standards and regulations.
- The Copper Development Association (CDA) launched a website and marketing campaign targeting decision makers in states slated to receive significant federal funding for **lead service line replacement**. CDA works to maintain and grow copper's 70 percent market share to capitalize on the potential 145,000 tonne demand over the next 10 years.
- 2023 marked the 12th year of a **successful building wire campaign** in Mexico with the support of Programa Casa Segura, an umbrella electrical safety program. The campaign has successfully kept copper-clad aluminum from becoming the approved material for interior electrical installations.

Market Intelligence

- An ICA commissioned study highlighted the **socio-economic value generated by the copper industry**, about $73 billion per year globally. This value includes long-lasting positive impact on society and the role copper mining plays in fostering socio-economic activities for mining communities. Copper mining was shown to be socially equitable, economically beneficial and environmentally sustainable.
- At CESCO in Santiago, Chile, ICA presented research **spotlighting copper as a key driver of the green transition**. Research showed system optimization has become an important driver for substitution, making relative material cost less important in material choice.
- During Asia Copper Week in Shanghai, China, ICA sponsored a panel covering **the use of recycled content in copper products**. The results of a global survey focused on advancing scrap recycling, identifying barriers and understanding demand for recycled copper. Cost, ESG ambitions and consumer expectations were noted as key drivers of scrap use.
- ICA's intelligence outreach program works to publish content in a broad range of publications and leading industry magazines. ICA's data has appeared in *Modern Mining, Mining Journal, Copper Worldwide, Reuters, Bloomberg* and *Mining and Minerals Today.*

Market Strategy

- In 2023, **India's Central Public Works Department (CPWD)** revised the standards for electrical installations, incorporating the latest technological trends, green building norms and safety requirements for buildings constructed and maintained by CPWD. ICA India positioned copper as a preferred conductor, and as of July 2023, the revised specification mandated copper for all wires and cables within government buildings.
- ICA prevented All Aluminum Cable (AAC) from becoming the **China State Grid's** default cable material in Shandong province. Copper power cable share remains above 87 percent in China. The China State Grid is the single largest copper user in the world, purchasing 677k tonnes of copper power cable in 2023.
- A dedicated task force with ICA and International Wrought Copper Council (IWCC) members was established to address the opportunities and threats of the **high voltage cables in the EU offshore wind market**. About 90,000km of these cables are planned for installation between 2022 – 2032, representing an approximately one million tonne opportunity for copper.
- ICA engaged dozens of North American original equipment manufacturer material decisionmakers and influencers across four growth markets (automotive, commercial vehicles, industrial electrical equipment and alternative energy) to identify strategic design initiatives and trends impacting current and future copper use. Key takeaways include specific copper application miniaturization targets and timelines, and the existence of several downstream knowledge gaps regarding upstream sustainability/ESG initiatives.

Material Stewardship

LIFE-CYCLE SERVICES

- ICA publishes industry-best Life Cycle Assessments (LCAs) for global copper concentrate and cathode: The updated datasets and environmental profile published in three languages aim to support those making decisions on material selection in the marketplace and under regulatory frameworks with robust and high quality, industry average data on copper (independently reviewed for ISO compliance), unavailable elsewhere. This unique offering by ICA relies on member participation and data, and is sought after by life cycle practitioners and other stakeholders, and frequently referenced by market analysts as a benchmark.

- ICA in collaboration with International Wrought Copper Council and Copper Development Association (CDA) member companies completes LCAs for nine copper and copper-alloy semi-fabricated products, as well as a copper tube LCA representing 50 percent of China's copper tube production: These datasets demonstrate sustainability credentials (e.g., carbon footprint) of copper products, and support copper product selection in the marketplace and along supply chains versus products made from competing materials.

TECHNICAL ADVOCACY IN THE EU AND CHINA

- ICA advocacy results in recognition of the role of responsible production certification schemes, such as the Copper Mark®, in meeting human rights due diligence requirements in new EU legislation. These efforts enable members to demonstrate their sustainable practices through existing frameworks already in use, thereby reducing the reporting burden for companies.

- The EU Parliament adopted three legislative amendments recognizing bioavailability (i.e., copper in water that is available for uptake by organisms – usually less than total copper) under the Water Framework Directive following advocacy by ICA. These amendments will ensure that state-of-the-science approaches are used to set environmentally relevant and reasonable emissions limit values for copper in water, positively impacting permitting for copper facilities in the EU.

- After three years of collective advocacy with the Chinese copper industry, ICA launched a pilot project in Huangshan City to use recycled copper from end-of-life electrical equipment in state grid infrastructure.

COMMUNICATING INFORMATION ON COPPER MATERIAL HAZARD

- At a major U.S. symposium on health product declarations, CDA won an All-Star Case Study award for showcasing a model for trade association engagement on sustainability and material health. The case study sets the standard for how to best disseminate state-of-the-art science health hazard information on copper to those making decisions on material selection.

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