Rio Tinto and Amazon Web Services collaborate to bring low-carbon Nuton copper to U.S. data centres

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Rio Tinto today announces a strategic collaboration with Amazon Web Services (AWS) that will see AWS become Nuton® Technology's first customer following the breakthrough industrial-scale deployment of the innovative bioleaching technology at the Johnson Camp copper mine in the U.S. last month.

Under the two-year agreement, AWS will use the first Nuton copper ever produced in components of its U.S. data centres, while also providing cloud-based data and analytics support to accelerate the optimisation of Nuton's proprietary bioleaching technology at Gunnison Copper's Johnson Camp mine. Data centres use copper in a wide variety of applications, including electrical cables and busbars, windings in transformers and motors, printed circuit boards, and heat sinks on processors.

Nuton is also utilising AWS platforms to simulate heap-leach performance and feed advanced analytics into Nuton's decision systems, allowing for optimised acid and water use while improving predictions for copper recovery. It's modular bioleaching system works by extracting copper from primary sulphide ores using naturally occurring microorganisms. This approach, combined with digital tools, enables rapid scaling and tailoring of the technology to different ore bodies, reducing the pathway from concept to production.

The process produces 99.99% pure copper cathode at the mine gate and removes the need for traditional concentrators, smelters and refineries, significantly shortening the mine-to-market supply chain. Nuton is projected to use substantially less water and have lower carbon emissions compared with conventional concentrator processing routes, while also recovering value from ore previously classified as waste.

Rio Tinto Copper Chief Executive Katie Jackson said: "This collaboration is a powerful example of how industrial innovation and cloud technology can combine to deliver cleaner, lower-carbon materials at scale. Nuton has already proven its ability to rapidly move from idea to industrial production, and AWS's data and analytics expertise will help us to accelerate optimisation and verification across operations.

"Importantly, by bringing Nuton copper into AWS's U.S. data-centre supply chain, we're helping to strengthen domestic resilience and secure the critical materials those facilities need, closer to where they're used. Together we can supply the copper critical to modern data infrastructure while demonstrating how mining can contribute to more sustainable supply chains."

Amazon's Chief Sustainability Officer Kara Hurst said: "Amazon's Climate Pledge goal to reach net zero carbon by 2040 requires us to innovate across every part of our operations, including how we source the materials that power our infrastructure.

"This collaboration with Nuton Technology represents exactly the kind of breakthrough we need-a fundamentally different approach to copper production that helps reduce carbon emissions and water use. As we continue to invest in next-generation carbon-free energy technology and expand our data centre operations, securing access to lower-carbon materials produced close to home strengthens both our supply chain resilience and our ability to decarbonize at scale."

Notes to editors

Gunnison Copper's Johnson Camp mine in Arizona is now the lowest-carbon primary copper producer in the U.S. on the mine to refined metal basis widely used by industry. Recent third-party life cycle assessment

(LCA) has confirmed Johnson Camp's Nuton copper is expected to have a full scope carbon footprint (Scope 1+2+3) of just 2.82 kgCO?e/kg Cu. The full-scope carbon footprint of primary copper varies by production method and technology but ranges from approximately 1.5 to 8.0 kgCO?e/kg Cu globally.

Through the purchase of 134,000 Green-e Energy certified renewable energy certificates, Nuton ensures 100% of the site's electricity is matched by on-site electricity consumption. Additionally, water intensity is anticipated to be 71 litres per kilogram copper, compared to the global average industry estimate of ~130 litres per kilogram of copper production[1].

The project is targeting production of approximately 30,000[2] tonnes of refined copper across a four-year deployment period.

[1] Water and carbon emissions intensities for Johnson Camp and global averages have been validated by Skarn Associates, a leading provider of carbon and water intensity curves for the industry.
[2] Includes ~16kt from run of mine leaching pad and ~14kt from Nuton technology.

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