

Green Mining Accelerates with Electrification, Bioleaching & Digital Technologies Driving Sustainability | DataM Intelligence

The green mining market rapidly grows with electrified fleets, bioleaching, water reuse and carbon capture, meeting demand for clean-energy minerals sustainably

NEW YORK, NY, UNITED STATES, July 30, 2025 /EINPresswire.com/ -- Market expansion in [Green Mining](#) is driven by stringent environmental regulations, the rising demand for sustainably sourced minerals critical to clean-energy technologies, and advances in low-impact extraction methods.

Companies are deploying waterless hydraulic systems, biodegradable reagents, and electrified haul trucks to minimize carbon footprints, while applications span lithium and cobalt recovery for batteries, rare earth elements for wind turbines, and copper and nickel for electric grid infrastructure. Governments and investors are channeling funds into digital mine planning, real-time emissions monitoring, and circular-economy initiatives transforming resource

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Green mining is redefining resource extraction combining electrified fleets, bioleaching, and carbon capture to deliver critical minerals with minimal environmental impact”

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extraction into a more responsible, low-waste industry that meets global decarbonization objectives.

The Green Mining Market reached US\$11.2 billion in 2022 and is projected to attain US\$17.9 billion by 2030, growing at a CAGR of 9.6% between 2024 and 2031.

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Green Mining Market

Green Mining Market Recent Key Developments and Technology Advancements :

July 2025 – Rio Tinto commissioned its first fully electrified haul truck fleet at the Oyu Tolgoi copper mine in Mongolia, reducing diesel consumption by 30% and cutting CO₂ emissions by 15,000 tons annually.

June 2025 – Vale S.A. launched a pilot plant in Sudbury, Canada, employing bioleaching with specialized bacteria to extract nickel and copper, eliminating sulfur dioxide emissions from smelting.

May 2025 – Anglo American unveiled a solar-powered water treatment system at its Los Bronces site in Chile, recycling 70% of process water and cutting freshwater withdrawals by 50%.

April 2025 – Tata Steel deployed drone-based methane leak detection across its iron-ore operations in India, using infrared imaging and AI analytics to pinpoint and repair emissions sources in real time.

Green Mining Market Acquisitions and Mergers :-

In Q2 2025, BHP Billiton acquired a 40% stake in Sany Group's electric mining equipment division, accelerating development of heavy-duty electric excavators for remote operations.

Liebherr finalized the purchase of an Australian sensor analytics startup in June 2025, integrating predictive maintenance algorithms into its mining trucks and drills to extend equipment lifespan.

Dundee Precious Metals merged with Glen Core in July 2025, combining sustainable gold recovery technologies such as closed-loop cyanide destruction with renewable energy microgrids at remote sites.

Green Mining Market Opportunities :-

Battery-Metal Extraction: Growing electric-vehicle (EV) production fuels demand for sustainably mined lithium, cobalt, nickel, and manganese creating partnerships between miners and battery makers to secure "green-grade" feedstock.

Digital and Autonomous Mining: AI-driven resource modeling, autonomous drilling rigs, and 5G-enabled real-time data analytics optimize ore recovery while minimizing energy use and environmental disturbance.

Water Stewardship Solutions: Technologies such as closed-loop water circuits, desalination for mine-site supply, and passive tailings dewatering present licensing and services revenue

streams.

Carbon-Capture Integration: On-site CO₂ capture from smelting and power centers, paired with mineral-carbonation for permanent storage, offers dual revenue from emissions credits and enhanced sustainability credentials.

Circular-Economy Metal Recycling: Urban mining of electronic waste and end-of-life batteries can be integrated with primary green-mining operations, enabling a holistic, lower-impact supply chain for critical minerals.

Green Mining Market Key Players :-

Rio Tinto
Sany Group
BHP Billiton
Vale S.A.
Tata Steel
Anglo American
Dundee Precious Metals
Liebherr
Glen Core
Jiangxi Copper Corporation

Green Mining Market Segmentation :-

By Technology:

Electric & Hybrid Machinery
Bioleaching & Bioremediation
Water Reclamation & Treatment
Renewable-Energy Integration
Carbon Capture & Mineralization
Digital Mining (AI & IoT)

By Mineral Type:

Copper
Iron Ore
Lithium & Cobalt
Nickel
Gold & Precious Metals
Rare Earth Elements

By End-Use Industry:

Electric Vehicles & Batteries
Renewable Energy Infrastructure
Electronics & Semiconductors
Construction & Infrastructure
Chemicals & Catalysts

By Geography:

North America
Europe
Asia-Pacific
Latin America
Middle East & Africa

Latest News – USA

In July-2025, the U.S. Department of Energy awarded Tata Steel and Liebherr a joint grant to develop carbon-neutral iron-ore pelletizing using hydrogen reduction. In June-2025, Rio Tinto broke ground on a \$200-million green-hydrogen plant in Utah to power its Kennecott copper operations. In May-2025, BHP Billiton announced pilot testing of autonomous EV haul trucks at its Arizona copper mine, in partnership with Sany Group.

Latest News – Japan

In July-2025, Japan's METI launched a green-mining subsidy program under its "Green Growth Strategy" to co-fund CO₂ capture installations at Jiangxi Copper-operated mines abroad. In June-2025, Anglo American inaugurated its Tokyo R&D center focusing on bioleaching microbes for high-nickel laterite ores. In April-2025, Vale S.A. signed an MoU with Japanese steelmakers including Tata Steel subsidiaries to supply sustainably mined iron ore for low-carbon steelmaking trials.

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