GSR ANALYTIX

ISSUE 03
SEPTEMBER 2026
GLOBAL EDITION

MINING MAGAZINE

WORLD MINING OUTLOOK

CRITICAL MINERALS • TECHNOLOGY • INVESTMENT • SUSTAINABILITY

AUSTRALIA

THE CRITICAL MINERALS POWERHOUSE

IRON ORE • GOLD • LITHIUM • RARE EARTHS



GLOBAL CRITICAL MINERALS
Supply security for a changing world

SMART & AUTONOMOUS MINING
AI, robotics and next-generation operations

ENERGY TRANSITION
Copper, lithium and minerals powering electrification

SUSTAINABLE OPERATIONS
Water, emissions and responsible growth

SPOTLIGHT

AUSTRALIA

RESOURCES POWERING THE FUTURE

CRITICAL MINERALS | MINING TECHNOLOGY | EQUIPMENT | ESG & SUSTAINABILITY | GLOBAL INVESTMENT

ISSUE 03

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Australia spotlight + global mining intelligence

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AI, robotics, remote operations and the connected pit.

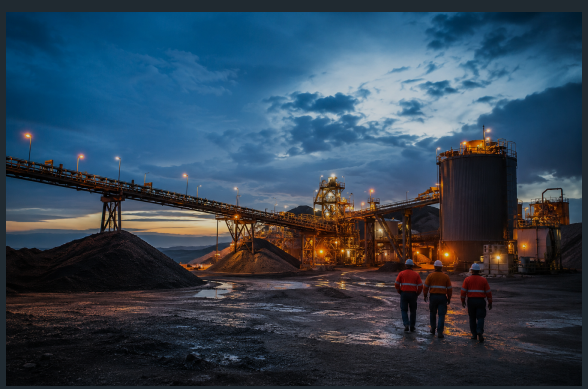
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COUNTRY FOCUS

40%+

Australia-focused pages and examples.

GLOBAL VIEW

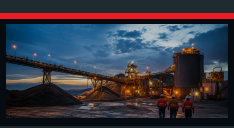
50%+

World trends keep the issue relevant everywhere.

EDITORIAL PROMISE

- Country depth without losing the global reader.
- Decision-useful themes rather than a country introduction.
- Clear opportunities for miners, suppliers, investors and technology firms.
- A consistent visual system aligned with GSR Tech Magazine.

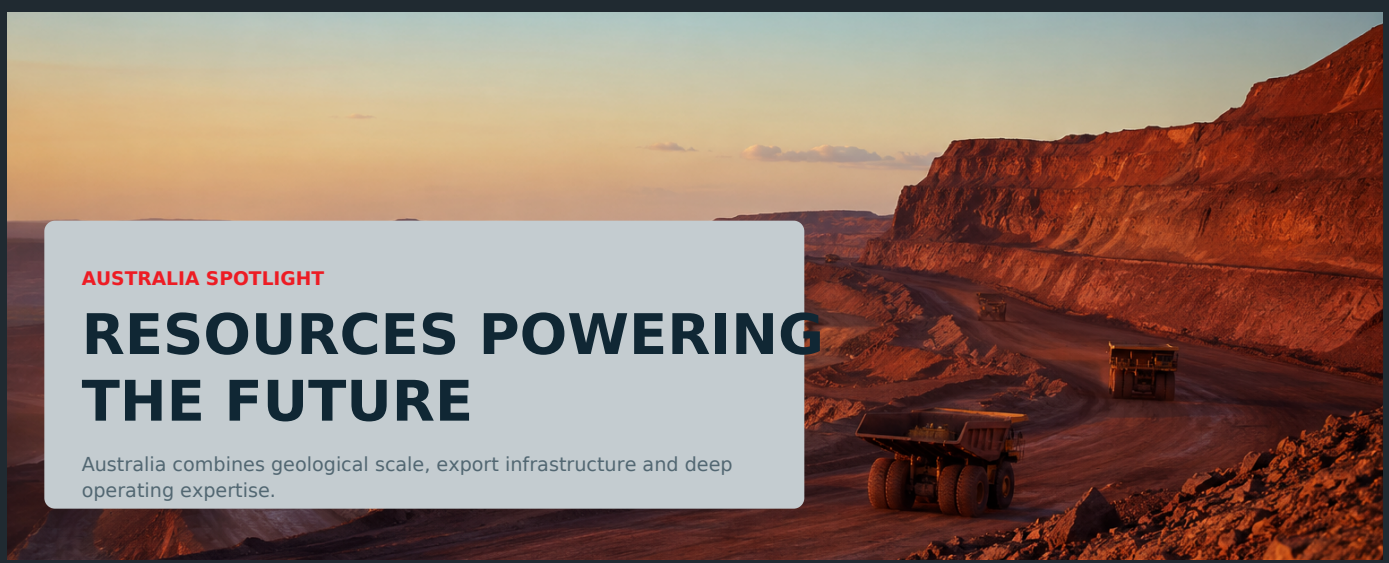
A STRATEGIC INDUSTRY NEEDS A GLOBAL VIEW



COUNTRY SPOTLIGHT

AUSTRALIA: THE RESOURCE SUPERPOWER

Mining scale, strategic minerals and global partnerships



AUSTRALIA SPOTLIGHT

RESOURCES POWERING THE FUTURE

Australia combines geological scale, export infrastructure and deep operating expertise.

CORE STRENGTH

IRON ORE

Pilbara scale, rail-and-port integration and Asian demand.

GROWTH ENGINE

LITHIUM

Hard-rock supply and expanding interest in conversion capacity.

STRATEGIC FRONTIER

RARE EARTHS

Diversified supply chains and advanced processing ambitions.

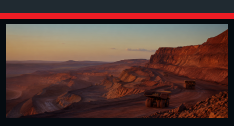
WHY AUSTRALIA MATTERS

- A top-tier mining jurisdiction with global export reach.
- Major positions in iron ore, gold, lithium and critical minerals.
- Sophisticated mining services, engineering and automation ecosystem.
- Strong alignment with allied supply-chain diversification.

THE COMMERCIAL TEST

- Can projects secure power, water, labour and infrastructure?
- Can processing compete against established Asian ecosystems?
- Can permitting and community engagement keep pace with demand?
- Can partners deliver cost reduction and measurable decarbonisation?

AUSTRALIA'S ADVANTAGE IS BUILT ON SCALE + SYSTEMS



Sources: Geoscience Australia; Australian Government Department of Industry, Science and Resources

AUSTRALIA

CRITICAL MINERALS: FROM ROCK TO VALUE

The strategic opportunity is moving downstream

01 DISCOVER
Geoscience, drilling, resource definition

02 DEVELOP
Permitting, finance, infrastructure

03 EXTRACT
Safe, productive, automated operations

04 PROCESS
Concentration, refining, conversion

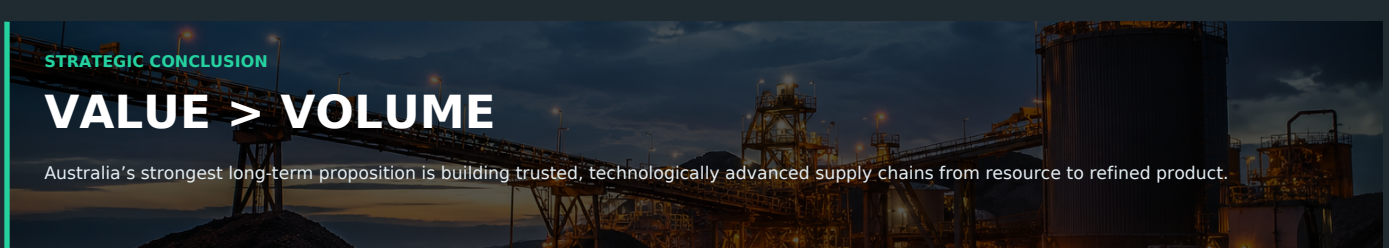
05 CONNECT

PRIORITY MINERALS

- Lithium: batteries and chemical conversion.
- Rare earths: permanent magnets and defence supply chains.
- Cobalt and nickel: battery chemistry and specialty alloys.
- Vanadium and graphite: storage, steel and anode materials.
- Copper: electrification, grids and data infrastructure.

PARTNER OPPORTUNITIES

- Mineral processing and separation technology.
- Renewable power, storage and mine-site electrification.
- Water treatment, tailings and environmental monitoring.
- Automation, sensing, analytics and industrial cybersecurity.
- Offtake, project finance and long-term customer partnerships.

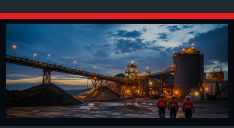


STRATEGIC CONCLUSION

VALUE > VOLUME

Australia’s strongest long-term proposition is building trusted, technologically advanced supply chains from resource to refined product.

VALUE IS CREATED AFTER THE ORE LEAVES THE PIT



Sources: Australian Critical Minerals Strategy 2023-2030; Geoscience Australia

WORLD MINING

A STRATEGIC MARKET, NOT JUST A CYCLE

Security of supply is reshaping investment decisions

DEMAND DRIVER

ELECTRIFICATION

Grids, EVs, storage and data centres intensify mineral demand.

POLICY DRIVER

SECURITY

Governments are backing diversified and traceable supply chains.

CAPITAL DRIVER

DISCIPLINE

High costs and long lead times reward selective project development.

GLOBAL FORCES

- Resource nationalism and strategic stockpiling.
- Trade restrictions and friend-shoring.
- Falling ore grades and deeper, more complex deposits.
- Competition for skilled labour and affordable power.
- Higher expectations on water, emissions and community outcomes.

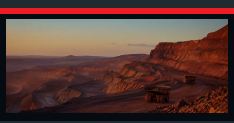
WINNING CAPABILITIES

- Operational resilience and scenario planning.
- Local partnerships and supply-chain visibility.
- Fast technology deployment with clear payback.
- Modular processing and brownfield productivity gains.
- Credible social licence and transparent performance data.

THE GLOBAL DECISION MATRIX

Copper	Very high structural relevance
Lithium	High growth, volatile pricing
Iron ore	Scale market, China-sensitive
Gold	Defensive investment demand

SUPPLY SECURITY IS NOW AN INVESTMENT CRITERION



Sources: IEA Global Critical Minerals Outlook; World Bank Minerals for Climate Action; OECD

FROM PIT TO PLATFORM

SMART & AUTONOMOUS MINING

Digital systems are becoming core operating infrastructure



PRODUCTIVITY

24 / 7

Remote and autonomous operations reduce variability.

VISIBILITY

REAL TIME

Connected assets turn operations into measurable systems.

THE OPERATING MODEL

HUMANS + MACHINES

Automation works best when technology, workflow, skills and governance are redesigned together.

TECHNOLOGY STACK

- Autonomous haulage and drilling.
- Fleet management and dispatch optimisation.
- Machine vision and ore sorting.
- Predictive maintenance and digital twins.
- Private networks, edge computing and industrial IoT.

DEPLOYMENT RISKS

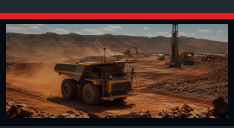
- Legacy-system integration and data quality.
- Industrial cybersecurity and operational continuity.
- Workforce acceptance, skills and change management.
- Vendor lock-in and unclear technology ownership.
- Pilot projects that never scale across the enterprise.

INVESTMENT RULE

PAYBACK FIRST

The strongest mining technology proposals connect every feature to tonnes moved, recovery improved, downtime avoided, energy reduced or risk removed. Demonstration must become repeatable operating value.

UPTIME, SAFETY AND PAYBACK DRIVE TECHNOLOGY



MINERALS POWER THE SYSTEM

THE NEW INDUSTRIAL BACKBONE

Energy, mobility and digital infrastructure converge in the mine

COPPER Grids, motors, renewables, data centres

LITHIUM Electric mobility and stationary storage

NICKEL Batteries, alloys and industrial systems

RARE EARTHS Magnets, wind turbines, robotics, defence

GRAPHITE Battery anodes and industrial applications

DEMAND IS NOT ENOUGH

- Price volatility can delay otherwise strategic projects.
- Processing concentration remains a major vulnerability.
- Infrastructure and permitting shape real supply growth.
- Customers increasingly require provenance and emissions data.

AUSTRALIA'S POSITION

- Resource diversity and established mining expertise.
- Strong Asia-Pacific logistics and customer proximity.
- Potential for renewable-powered processing.
- Opportunity to serve allied and diversified supply chains.

ELECTRIFICATION REWRITES THE MINERAL MAP



Sources: IEA critical minerals analysis; Geoscience Australia; Australian Government

TRUST IS OPERATING CAPITAL

ESG & SUSTAINABLE OPERATIONS

Performance must be measurable at site and supply-chain level

WATER

Closed-loop systems, quality monitoring and basin-level planning

EMISSIONS

Electrification, renewable power, efficiency and methane control

TAILINGS

Engineering integrity, monitoring, governance and disclosure

COMMUNITY

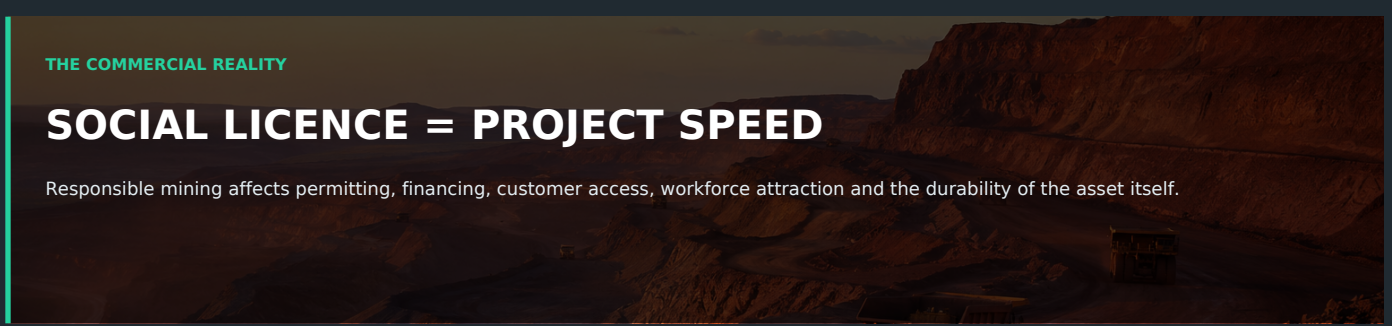
Early engagement, local value and durable benefit-sharing

BOARD-LEVEL QUESTIONS

- Which risks could stop production or delay expansion?
- Are claims supported by site-level data and assurance?
- Who owns community outcomes beyond the permit stage?
- Can product-level traceability reach the customer?

SUPPLIER-LEVEL QUESTIONS

- Does the solution reduce cost and environmental intensity?
- Can it operate reliably in harsh remote conditions?
- Is data interoperable, secure and auditable?
- Can results be scaled across multiple sites?



THE COMMERCIAL REALITY

SOCIAL LICENCE = PROJECT SPEED

Responsible mining affects permitting, financing, customer access, workforce attraction and the durability of the asset itself.

SOCIAL LICENCE IS OPERATING CAPITAL



Sources: OECD Due Diligence Guidance; Global Industry Standard on Tailings Management

AUSTRALIA DEEP DIVE

FIVE MARKETS, FIVE DIFFERENT STRATEGIES

A resource giant must be read commodity by commodity

IRON ORE: SCALE STILL DECIDES

Australia's iron ore advantage is built on more than geology. The Pilbara combines large deposits, dedicated rail networks, export terminals and decades of operating knowledge. This integrated system protects competitiveness even when prices soften.

The strategic issue is demand concentration. China remains central to seaborne trade, while green-steel technologies may gradually alter product preferences. Producers therefore need productivity, higher-grade products and disciplined replacement investment rather than volume growth alone.

LITHIUM: GROWTH WITH VOLATILITY

Hard-rock lithium made Australia a critical supplier to the battery chain, but mining exposure alone leaves earnings vulnerable to chemical prices and project cycles. The industry's next test is whether conversion and refining projects can reach stable, internationally competitive economics.

Investors should separate long-term electrification demand from short-term price enthusiasm. Ore quality, recovery, power cost, customer contracts and balance-sheet strength matter more than headline resource size.

GOLD: RESILIENCE AND OPTIONALITY

Gold gives the Australian mining portfolio a defensive counterweight. Demand is driven by investment, central-bank activity and risk sentiment rather than only industrial consumption. Strong geological expertise and mature service networks support continued exploration and mine-life extension.

For operators, grade control, energy intensity and replacement reserves remain decisive. For suppliers, the best openings lie in underground productivity, sensing, recovery optimisation and lower-cost environmental management.

RARE EARTHS: PROCESSING IS THE PRIZE

Rare-earth projects are strategically important because supply chains remain concentrated and separation is technically demanding. Australia can offer trusted supply, but commercial success requires processing capability, customer qualification and patient capital.

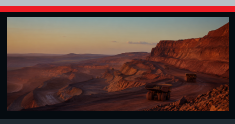
Policy support can improve project viability, yet it cannot replace operational competitiveness. Projects must secure reagents, power, technical talent, waste management and long-term offtake at the same time.

GSR ANALYTIX SECTOR COMMENT

Australia's opportunity is often described as "more critical minerals." The more useful interpretation is "more value per tonne." Future winners will connect mining, processing, clean power, logistics, technology and customer contracts in one investable system. This favours partnerships between miners, engineering groups, equipment suppliers, technology firms and end users.

The country will remain a global extraction leader, but its strategic influence will grow fastest where it can offer reliable processed material, transparent provenance and lower-carbon production. Cost discipline must remain central: strategic importance does not protect a project from weak economics.

COMMODITY DEPTH REQUIRES DIFFERENT STRATEGIES



BEYOND COMMODITY PRICES

HOW THE MINING MODEL IS CHANGING

The decisive competition is moving from deposits to complete systems

CAPITAL: SELECTIVITY REPLACES EXPANSION

Mining companies face an unusual combination of structural demand and investment caution. Projects are larger, slower and more exposed to construction inflation, permitting delays and political intervention. Boards therefore prefer brownfield expansions, debottlenecking and staged development where risk can be controlled.

This does not mean a shortage of opportunity. It means capital will reward assets with infrastructure, credible customers, robust metallurgy and management teams that can deliver. Resource size without execution quality will attract less premium than it once did.

PROCESSING: THE STRATEGIC BOTTLENECK

Many governments want diversified mineral supply, but mining capacity alone cannot create a resilient chain. Concentration, refining, conversion and component manufacturing are the harder layers. They require specialist knowledge, steady energy, environmental controls and customers willing to qualify new supply.

The commercial opening is therefore broad: modular plants, separation technology, reagents, process control, water systems, laboratories and traceability platforms all become part of mineral security.

EQUIPMENT: UPTIME BEATS NOVELTY

Mine operators are receptive to automation and electrification, yet procurement remains conservative for good reason. A failed system can stop production. Suppliers must demonstrate reliability in dust, heat, vibration and remote conditions, then provide local parts, technicians, training and cybersecurity.

The strongest sales proposition is measurable operating value: fewer unplanned hours, lower fuel consumption, improved recovery, safer work or a shorter maintenance cycle.

TRADE: MINERALS BECOME GEOPOLITICAL

Export controls, subsidies, strategic partnerships and local-content rules increasingly shape mineral flows. Companies must understand not only price and logistics but also origin, sanctions, investment screening and customer-country policy.

Diversification will create parallel supply chains rather than one perfectly global market. Producers with trusted documentation and flexible customer portfolios gain resilience; buyers may accept higher costs in exchange for security.

GSR ANALYTIX GLOBAL VIEW

The mining supercycle narrative is too simple for the present market. Different minerals have different demand curves, processing constraints and policy exposure. Copper faces long project lead times; lithium faces rapid supply response and price volatility; nickel confronts cost competition; rare earths face difficult separation and qualification; iron ore remains tied to steel and Chinese demand.

For international suppliers, success will come from choosing a narrow operational problem and solving it completely. Local representation, after-sales service and proof of economic impact will matter more than broad product catalogues. For investors, jurisdiction quality must be assessed alongside infrastructure, technology readiness and social licence.

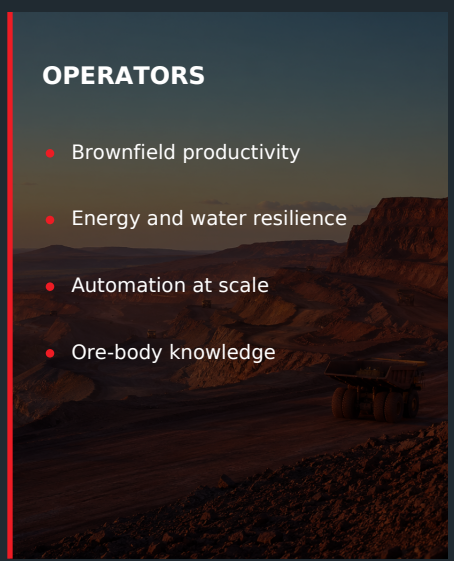
THE FUTURE COMPETITION IS IN COMPLETE SYSTEMS



WHERE OPPORTUNITY MEETS EXECUTION

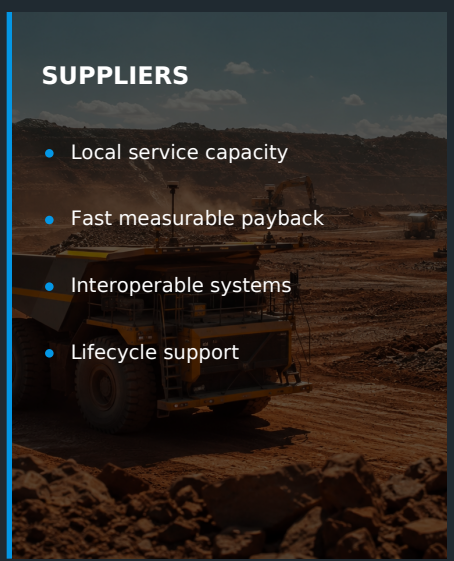
MINING BUSINESS MAP 2026

Commercial priorities for operators, suppliers and investors



OPERATORS

- Brownfield productivity
- Energy and water resilience
- Automation at scale
- Ore-body knowledge



SUPPLIERS

- Local service capacity
- Fast measurable payback
- Interoperable systems
- Lifecycle support



INVESTORS

- Jurisdiction and permitting
- Infrastructure readiness
- Offtake quality
- Cost and execution risk

AUSTRALIA + WORLD: THE FINAL CHECKLIST

01 RESOURCE
Quality, scale, metallurgy and mine life

02 ROUTE
Infrastructure, processing and customer access

03 POWER
Energy price, reliability and decarbonisation

04 PEOPLE
Skills, safety, community and partnerships

05 CAPITAL
Funding, schedule, inflation and execution discipline

06 TRUST
Traceability, disclosure and responsible operations

MINING INTELLIGENCE FOR GLOBAL DECISIONS

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