Future Mining Scenarios

A forward-looking exploration of the mining industry's future, set against the backdrop of the year 2050

Divided Dominions

Self-contained blocs imperil economic growth and development

Persistent grievances over influence, power, and wealth distribution drove de-globalisation leading to the establishment of self-contained trade blocs built on distinct approaches to global issues and economic and social governance. This new system is predominantly shaped by dominant major powers and their interests, aimed at bolstering their competitiveness of critical industries such as AI, space, defence, communications, electronics, and health. However, amidst escalating geopolitical rivalries and exclusion from elite blocs, excluded nations formed their own alliances and obstructed the export of critical raw materials. Regional conflicts and proxy wars ensued, fuelled by historical animosities and opportunism.

The emergence of self-contained and reactionary blocs imperilled research, innovation, and the energy transition, yielding only modest long-term economic growth. Fragile peace consistently faced threats from conflicts driven by 'realpolitik.' The cascade of economic and political disruptions catalysed waves of mass migration, civil unrest, and ideological extremism, overwhelming the capacities of fragile governments. Hollowed-out public sectors were unable to deliver essential services leading to expansion of shadow networks and militant factions. Severely weakened international organisations were unable to provide any real influence on addressing of global concerns, such as climate change impacts, and volatile critical raw materials markets undermined long-term development efforts, hindering investment and growth in the extraction and recycling industries. This inefficiency cascaded through the economy, impacting the entire raw materials supply chain.

Key aspects

International Cooperation and Trade

Rising nationalism led dominant countries to abandon global cooperation, constructing restrictive trading blocs centred on boosting domestic industries. Major bloc powers utilised protectionist tools like discriminatory standards, punitive tariffs, and import/export bans to severely limit inter-bloc trade and collaboration. Smaller mineral-producing nations were coerced into joining rival blocs, frequently shifting allegiances based on patronage rather than shared values. This fracturing enabled internal bloc trade flows at the expense of overall market stability, efficiency, and innovation potential.

Stability of Domestic Policies

Dominant blocs maintained partisan priorities to bolster global positioning. Cooperation on transnational issues like climate change faced zero-sum mentalities focused on mitigating impacts within blocs. Regime changes adopted status quo policies due to militaristic and corporatist faction pressures benefiting from geopolitical tensions. Reform attempts were thwarted as political leaders deployed nationalism and external threats to deflect from governance failures. Civic dissent faced crackdowns justified as pre-empting subversion. The divide became self-fulfilling, bereft of collective leadership on shared challenges.

Economic Development

The fragmentation has ruptured integrated supply chains and demand dynamics across sectors, resulting in severe commodity price volatilities, market uncertainties, and speculation-fuelled hoarding within blocs. Growth prospects drastically diverged between blocs as competitive mindsets superseded cooperative advancement. Uneven intra-bloc development deepened societal rifts whenever governance was captured by entrenched blocs favouring militarisation and industrial subsidies over inclusive human development. Supply disruptions and declining productivity instigated prolonged stagnation, severely challenging developing countries.

Infrastructure

Trade bloc fragmentation increased risks and uncertainty, reducing mining and infrastructure investment returns. Postponed upgrades and maintenance accelerated deterioration, imposing limits on reliable extraction and exports. Logistical bottlenecks and inefficiencies became commonplace.

Price Volatility

Frequent boom-bust cycles within blocs made mining riskier as forecasting grew unreliable and capital markets less diverse. Concentrated markets meant key players exaggerated ripple effects. While benefiting some, sporadic volatility hampered expansion plans and productivity growth.

Profit

Commodities largely sourced from lesser developed nations were particularly positioned to influence pricing within a given bloc. By leveraging their unique role in supporting economic activities, the supplying nations would shift allegiance to blocs with the best offer, creating pricing volatility within a bloc but not necessarily globally.

Social Attitude towards Mining

Initial mining acceptance gave way to scepticism and resistance, fuelled by lagging transparency, captured local benefits and environmental incidents straining trust. Uneven local hiring and rehabilitation eroded public confidence, with social unrest risks growing alongside inequality, vulnerability gaps and civic voice deficits.

Mining Value Chain

Automation, analytics, and interconnected hardware boosted productivity, real-time supply-demand modulation, and predictive maintenance insulating against volatility. Critical advances included autonomous vehicles, AI, and drone surveying enabled continuous operation. However, with lower employment intensity, acute labour and skills shortages persisted despite increased recruiting budgets. And under worsening economic cycles and uncertainty, critical material demand languished as energy transition implementation stalled. Prices plunged as miners scaled back high-cost operations, slashing exploration, projects, and expansions while retaining lowest-cost mines. Prolonged downturns bankrupted undercapitalised miners, concentrating supply without cooperative policies and incentives for sustainable equitable growth.

Financially constrained miners traded equity for offtake agreements and risk-sharing with manufacturers for stable demand amid volatility. Volatility drove recycling and substitution R&D to bypass imbalances and lower primary dependence. But progress remained limited to developed blocs with financing, commercialisation incentives, and sustainability-conscious demand. Breakthroughs improved urban mining and reclamation viability, but diffusion barriers hindered global gains.

Winners

- Dominant bloc powers able to push partisan interests using economic and military power.
- Most developed economies.
- A small proportion of developing countries with
- good geological endowments and existing infrastructure.

Loosers

- Future generations.
- A large proportion of developing countries.
- Multilateral institutions, unable to broker meaningful accords across hostile blocs / Global institutions like UN, G20, WTO, ICC.
- Citizens in totalitarian regimes, where repression stifles dissent and liberties.

Protagonists

- Major power blocs leaders aggressively pushing partisan agendas.
- State-backed miners, aligned with governing regimes for patronage.
- Developing nations with unique resources of global demand.
- Speculators and middlemen exploiting volatility for profits.
- Multilateralists aiming to heal rifts by aligning incentives.
- Activist citizens pressuring blocs on sustainability and rights failures.
- Developers of breakthrough technologies.

Intraw
International Raw Materials Observatory
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The Ambassador Alfred Hoffman, Jr. Center for Critical Minerals Strategy

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