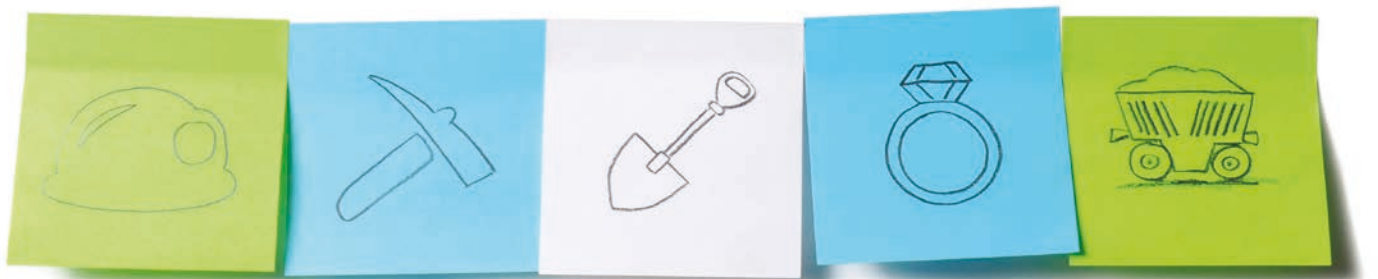


Mining spotlight on: Sliding productivity and spiraling costs

Strategies for reclaiming efficiency in the mining sector



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Over the past year, mining executives have received one message, loud and clear: markets will no longer tolerate production at any cost. During the height of the mining boom, record-breaking commodity prices notionally supported the development of marginal high-cost, low-productivity mineral deposits. As commodity prices dropped, companies responded by slashing costs – a traditional response to a shifting market cycle. Which begs the question: When the cycle turns again, will costs once more rise to unsustainable levels?

To prevent this constant cycle of cost takeout and cost creep, miners must go beyond traditional cost cutting measures. Instead, industry productivity (defined as the GDP value contribution an average worker creates in an hour of work) needs to rise before companies can reclaim shareholder support and deliver bottom line value.

What's pushing productivity down?

For decades, productivity has been slipping in mining regions around the world. A combination of factors is responsible for this decline, including:

- **Talent shortages.** Despite a slower pace of development, the mining industry's talent shortage persists. In many regions, a high percentage of the industry's workforce is nearing retirement and skilled workers – including project designers, mining geologists and engineers – remain in short supply. In addition to pushing up labor costs, these structural market trends put greater pressure on existing staff to do more with less, reducing employee productivity.
- **Declining resource quality.** Between 2001 and 2012, the weighted average head grade for copper fell by almost 30% and nickel dropped by 40%. Zinc and gold grades each fell by roughly 10%. In fact, some gold projects yield less than one gram per ton. As ore grades decline, production costs for each ounce or ton rise, taking a toll on industry productivity. We are living in a world of old mines with investors frowning on attempts by miners to develop new assets.
- **Elevated input costs.** Although there is some evidence that industry cost pressures are abating, input and production costs remain stubbornly high on everything from infrastructure (ports, roads, railways, water, electricity), labor, contractor rates and equipment to taxes, royalties, permitting fees and compliance. To complicate matters, most of the industry's capital investments take years to yield output, leading to near-term productivity shortfalls.
- **Inefficient capital allocation.** In their headlong rush to produce at any cost, many mining companies went beyond over-spending on labor and production. They also sunk significant resources into marginal mines that can no longer produce profitably in today's lower commodity price environment.

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The costs of contraction

Given the productivity challenges in mining regions around the world, companies are under extreme pressure to produce more efficiently. Unfortunately, this task is vastly complicated by the current high-cost environment.

What's pushing costs up?

In many ways, the factors that are causing productivity to slip—including declining ore grades and talent shortages—also contribute to escalating costs. Other industry trends are also playing a role, including:

- **Deeper and older mines.** Since the start of 2000, over 75% of new base metal discoveries are hidden at depths of more than 300 metres. Beyond inflating safety risks, mining at depths (and heights) significantly increases the costs of extraction.
- **Heightened sovereign risk.** As the world's "easy" deposits have become depleted, mining companies have increasingly expanded to more remote regions, amplifying the costs of infrastructure builds, transportation and utilities. In many jurisdictions, winning a social license to operate also escalates costs around regulatory compliance, environmental management, local development mandates and stakeholder relations.
- **Critical infrastructure shortages.** Companies that operate in remote regions and arid climates also struggle with severe water shortages which, in turn, frequently spur mounting energy costs as companies expend energy to pump water across vast distances or to high altitudes. In some countries, like South Africa and Chile, bottlenecks in electricity supplies mean miners face some of the highest power tariffs in the world.
- **Resource nationalism.** With the mining sector out of favor among some investors, many governments appear to be riding a wave of mounting hostility toward the industry. This continues to manifest as resource nationalism that has seen many governments impose rising mining industry taxes, permitting fees, export duties, discovery bonuses, royalties, indigenization quotas and reconstruction tolls.

How low productivity and high costs are hurting mining companies

With productivity down and costs up, many mines went from marginal to loss-making over the past year. Beyond affecting share prices, weaker commodity prices have had a major impact on the core financial metrics of many companies, eroding margins, earnings, cash flows and the carrying value of assets. In addition to putting companies in dire financial straits, these conditions have damaged shareholder trust and continue to make it harder for miners to attract both equity and debt financing.

Strategies that buck the trend

Miners can't control the vagaries of the world economy that shift currencies and commodity prices. However, they can control how they operate. As companies refocus on becoming lowest-quartile cost producers, they will need to move away from reactionary cost cutting and towards sustainable cost management programs.

Here are some strategies to consider.

Strengthen mine planning

To improve sector productivity, companies can:

- Refocus on high quality production by increasing cut off grades.
- Reduce capital expenditures in properties with lower production potential and shorter mine lives.
- Consider the benefits (and potential risks) of reducing reserves.
- Optimize mine sites through enhanced sequencing.
- Ramp up production from lower cost mines and prioritize lower cost projects.
- Attract and retain experienced mine planners capable of improving operational performance and tracking daily adherence to production volumes, mining locations and mineral content.

Improve budget and risk management

Independent project analysis in Australia shows that approximately 65% of mega-projects in excess of AU\$500 million fail to deliver targeted value.¹ To improve project outcomes, mining organizations can:

- Establish a clear line of sight on actual expenditures, including costs per unit of production.
- Share key metrics with engineering, procurement and construction management (EPCM) operators, mine operators and manufacturers.
- Strengthen working capital management.

Get serious about workforce planning

To maximize workforce productivity, companies must properly define their workforce assumptions and improve management across the talent lifecycle.

- Strengthen the owner's team by clarifying the business model governing mines, plants, infrastructure and sustainability.
- Foster a culture that discourages rampant spending.
- Keep employees engaged through programs such as flexible rosters, training and long-term career development.
- Have a system for identifying global resource requirements.
- Adopt less cost-intensive work practices, such as work clusters, cross-training and automation.
- Train local populations in key job functions.

1. World Coal, May 2013. "From Volume to Productivity," by Julian Dolby and Steve Dyson, Deloitte Australia.

Improve efficiencies through technology

Productivity is about maximizing throughput per unit of time, per unit of quality and per unit of cost.

Mining companies may wish to apply a better use of technology to achieve these goals:

- Seek out innovative technologies capable of unlocking deposits and improving productivity on the mine site.
- Use system transformation to address core business drivers, such as operating time and rate.
- Replace disjointed reporting systems with streamlined management dashboards that report on actual operational performance.
- Use production visibility tools to get an automated visual of mining operations from pit to port.

Pursue operational excellence.

To bring costs down in a sustainable way, mining companies can:

- Re-evaluate their operating models to ensure they have the management and reporting systems necessary to build a cost management culture.
- Adopt Lean/Six Sigma methodologies and techniques such as shareholder value analysis to identify and close operational efficiency gaps.
- Look to lessons that can be learned from other industries, e.g. process manufacturing.
- Instill a culture of sustainable operational improvement.

Invest in analytics

It is impossible to reduce the costs of safety, maintenance and other cost-intensive programs on a sustainable basis simply by examining component costs. Using analytics, companies can:

- Assess the costs of entire processes to uncover the underlying cost base and identify exceptions and outliers.
- Improve decision-making and asset performance by measuring both financial and non-financial indicators that affect overall profitability.
- Transport data from a wide range of disparate sources to deliver on-demand reports, enabling miners to improve asset utilization and reliability, minimize downtime, streamline mine planning and optimize fleet resources.
- Use emerging metrics to manage operational costs, such as measuring the mineral content of each shovel load to determine whether or not it is below cut off grades.

Rationalise the supply chain

To reduce costs, companies frequently ask suppliers for steep—and often unsustainable—cost concessions.

Rather than pushing the service sector to the wall, companies can:

- Establish global sourcing contracts.
- Build partnerships with those suppliers who have delivered demonstrable value.
- Renegotiate with major suppliers to win price concessions.
- Streamline supply chains by integrating processes with key input producers.

Right-size capital projects

To get capital costs under control, miners can:

- Transition to quick-start modular plants and projects that can be expanded as industry fundamentals improve.
- Put marginal mines into care and maintenance.
- More appropriately scale operations to suit individual projects.
- Build stronger funding practices by better understanding the difference between a project's value and the price the market sets.

How Deloitte can help

While not all of these strategies will apply to all companies, Deloitte member firms can help organizations serious about reducing costs and enhancing productivity to build a program tailored to their needs and geographic circumstances.

For more information, please contact a Deloitte mining professional: www.deloitte.com/mining

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