



Global Metals and Mining Outlook 2016

**Making the best of
a challenging environment**

KPMG International

kpmg.com/metalsmining

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“When growth does return, the market will likely be significantly different than in the past, particularly given the structural changes taking place and the environmental regulations currently being tabled around the world. You can't just batten down the hatches and wait for the storm to pass. It seems these executives are making the best of a difficult situation.”



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Richard has over a decade of experience in the energy industry spanning multiple sectors, including mining, and oil and gas, and extensive experience in audit and advisory services.

“To survive this downturn, miners will need to improve the way they allocate capital to prioritize cash flow and earnings. The worst thing mining companies can do right now is to pour more capital into increasing production.”

Methodology

This report is based on a survey of 62 senior metals sector executives conducted in early 2016 by Forbes Insights. Thirty-seven percent of respondents are based in the Americas and an equal number are based in Asia with the remainder located in Europe and the Middle East. Forty percent of our respondents represent companies with annual global revenues of more than US\$5 billion and 5 percent represent organizations with revenues of more than US\$25 billion.

To support the survey data, KPMG International conducted a series of interviews with KPMG's leading mining professionals around the world who provide their experience, insights and forecasts for key mining segments to deliver an unprecedented view of the challenges and opportunities faced by today's metal and mining organizations.



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The data presented in this report is based on a survey of Metals executives. All insights and viewpoints related to the metals and mining sectors are provided by KPMG's network of professionals.

CHAPTER 01

Growing ahead of the market

If the mood of metals executives is any indication of the state of the metals and mining industries, things may continue to be gloomy for some time. Yet while confidence in the global economy is low, our survey suggests that most metals and mining organizations believe they can survive — maybe even grow — in the medium term.

No respite soon

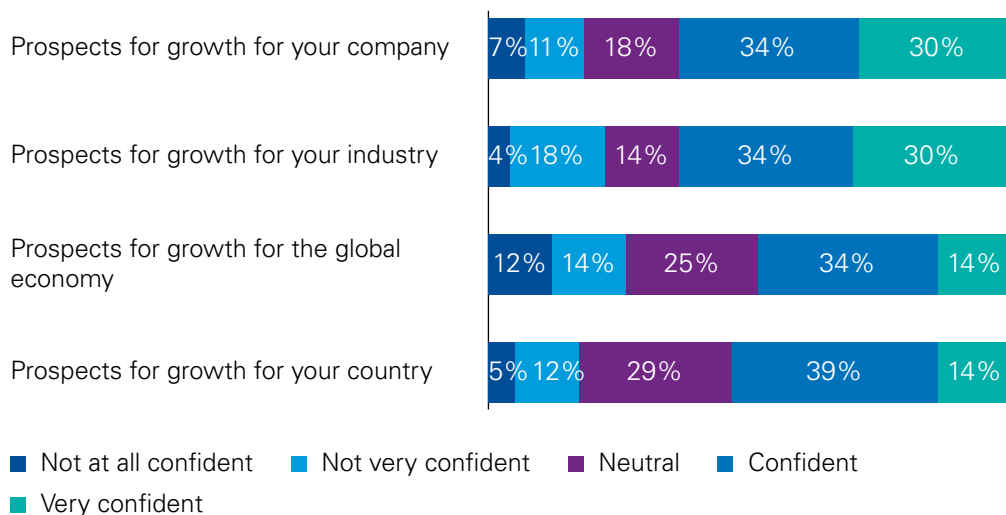
Given the tight relationship between the fortunes of the global economy and that of the global metals and mining industry, it does not bode well that fewer than half of the senior metals executives responding to the survey which is reflected in the “KPMG International’s 2016 Global Metals & Mining Outlook” voice any level of confidence in the prospects for the global economy over the next 2 years.

Yet most metals executives seem to believe their company can outperform the market, with almost two-thirds of metals executives saying they are confident they can achieve growth in the same period. Sixty-three percent believe the industry will achieve a measure of growth over the coming 2 years.

“With commodity prices remaining depressed and metals prices at record lows, most metals and mining executives feel they have reached the bottom of the cycle and that growth will, eventually, return,” notes Eric Damotte, Head of Metals for KMPG International. “You can’t just batten down the hatches and wait for the storm to pass; it will take significant consolidation in order to reduce current levels of structural overcapacity and disruption — from environmental regulation to new innovations — is continuously changing the business environment. The next growth cycle will look very different to the last.”

Confidence waning

Please indicate your level of confidence in terms of growth prospects with the following over the next 12 to 24 months:



Source: Forbes Survey, 2016

Note: Percentages may not add up to 100 due to rounding

Focused on costs, looking for growth

Not surprisingly, most metals organizations expect to spend the next 2 years focusing on finding deeper cost reductions, suggesting further pricing pressure for mining organizations and continued rationalization of metals assets. And our data suggests that appetite for cost cutting is increasing. Whereas 67 percent of our respondents say that cost and performance management was a high priority in the past, 77 percent now say it will be a high priority in the future.

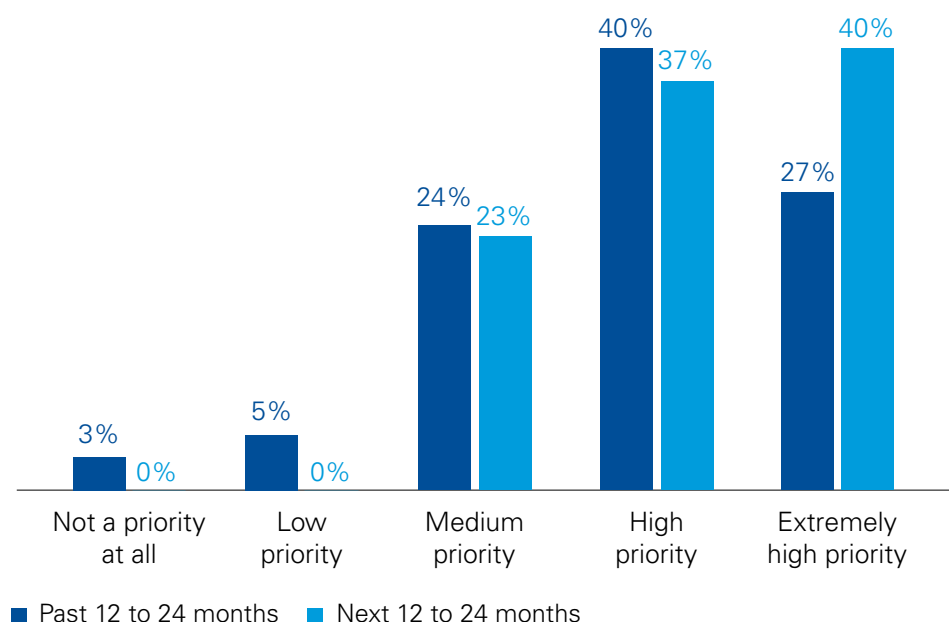
That being said, our data also clearly suggests that metals organizations will be much more eager in their search for new growth opportunities. Indeed, 71 percent of metals respondents say that growth will be a high or an extremely high priority over the next 2 years, versus just 58 percent who say it was a high priority in the past.

“As metals organizations move to consolidate their footprints in lower-cost centers and increase their focus on cost cutting, many are starting to pour investment into R&D and innovation in order to move further up the value chain and capture new areas of growth,” adds Eric Damotte. “While this focus on improving value will likely help shore up margins for metals organizations, it may not result in any significant increase in demand for mining companies over the near term.”

According to Richard Sharman, KPMG International’s Global Head of Commodity Trading, mining organizations are also carefully balancing their capital and investments in order to prepare for the next round of growth. “The worst thing mining companies can do right now is to pour more capital into increasing production,” he says. “To survive this downturn, miners will need to improve the way they allocate capital to prioritize cash flow and earnings.”

Increased urgency to cost cutting

Please rate each of the following in terms of how cost cutting has been a priority for your organization over the past 12 to 24 months, and how it will be a priority over the next 12 to 24 months:



Source: Forbes Survey, 2016

Note: Percentages may not add up to 100 due to rounding



What's the point?



Confidence in the global economy is low and metals organizations are ramping up their focus on cutting costs and performance improvements

What did metals executives say?

- **48** percent are confident about the global economy's prospects for growth.
- **77** percent are highly focused on improving cost and performance management.
- **71** percent say growth will be a high priority going forward.

How are leading metals organizations responding?

- Working with national governments and regulators to advocate for greater consolidation across the sector and the reduction of structural capacity in key markets.
- Focusing on products where they enjoy clear market or cost advantages in order to reduce the impact of commodity competition from lower-cost producers.

- Reinvigorating their efforts to identify and leverage efficiencies across the entire product portfolio.

How are leading mining organizations responding?

- Maintaining a strong focus on capital and capital deployment to prioritize cash flow returns over increased production volumes.
- Becoming more decisive about managing their balance sheets to focus on free cash flow generation.
- Improving the discipline around the management and use of their resources and ore bodies to focus on higher-growth or higher-margin commodities.



Spotlight on iron ore



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Pieter is the partner responsible for Accounting Advisory Services and is also the head of mining with KPMG in Brazil. He assists the Finance function in large global and Brazilian organizations. He specializes in complex technical accounting issues (Brazilian GAAP and IFRS), IPO advisory, cost management and financial close and reporting, particularly in the Energy and Natural Resources sector.

Iron ore prices are not expected to increase significantly from current levels: not good news for iron ore producers. Clearly, the days of US\$170 iron are long gone. The big question now is whether demand will return with enough strength to soak up the current overcapacity.

In the short term, all signs suggest that capacity will continue to outstrip demand as more low-cost supply comes online in Brazil and Australia, putting further pressure on prices globally. However, this will likely force some higher-cost producers to shut down their operations, which may help reduce supply pressures, but not significantly.

All iron ore producers will likely struggle to achieve substantial bottom-line growth in the current pricing environment. Having already conducted 4 years of rather intense cost-cutting exercises, most iron ore producers are now about as lean as they can be. Non-core assets are being divested, capital expenditure plans have been reduced or eliminated, and cost controls have been implemented.

The fact that two-thirds of metals executives in this survey say they are confident they can achieve growth over the next 2 years should come as welcome news to iron ore miners. With so much uncertainty and volatility with respect to demand over the past few years, any signal that points towards sustainable growth in demand should help iron ore miners start to rethink their longer-term investment and production plans.

Overall, we expect to see less volatility in iron ore prices in 2016 compared to the prior 2 years, but any price increases that are achieved will be gradual. For the time being, the iron ore industry continues to wait for prices to improve. This suggests they may be waiting for a while.

Consolidation and capacity reductions in China's steel sector



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Global steel prices enjoyed a lift at the start of 2016, largely on the back of positive signals coming out of China. Indeed, the recent rally is largely recognition that China's government policies aimed at reducing overcapacity and running down inventory stocks are working.

Recent announcements suggest that further consolidation is imminent. In June, two of China's largest state-owned steel producers — Baosteel Group (the world's fifth largest producer) and Wuhan Iron and Steel Group — announced plans to restructure 'together' to reduce their combined capacity.¹ China's government expects to close down almost 150 million tons of steel capacity and 500 million tons of coal production in the next 5 years, largely through these types of consolidations.

However, it will take some time before China's market comes back into balance. Most major institutions expect steel consumption in China to continue to fall for the next 2 years with demand for iron remaining fairly flat through the second half of 2016. The June/July flood that swamped central China and reduced overall production by almost a quarter may soften industrial demand in the short term, but reconstruction efforts may provide a longer-term demand boost for steel.

Against a backdrop of growing consolidation, lower inventory levels and higher prices, many observers now expect some of China's recently failing steel producers to return to profitability over the coming quarters. But with little to no growth anticipated in demand, China's steel manufacturers will need to avoid the temptation to ramp up production, as this would only serve to eliminate recent gains.

Given the government's continued focus on infrastructure investment in the most recent Five-Year Plan, it seems clear that demand for steel in China will continue to grow, albeit at a slower rate than in the past. If China's producers are able to remain rigorous in their efforts to consolidate and reduce capacity, all signs suggest a stronger and more profitable sector going forward.

1. Source <http://www.reuters.com/article/us-baoshan-steel-wuhan-steel-idUSKCN0ZC0EN>

CHAPTER 02

Looking for new opportunities

Having invested heavily into new capacity during the upcycle, many metals and mining operations are now keenly searching for new growth opportunities to help absorb some of their spare production capacity. Yet while metals executives can (and will) invest into lower-cost locations to consolidate their operations, mining organizations will likely continue to struggle with high fixed costs and footprints. Finding and capitalizing on opportunities for growth may not be easy.

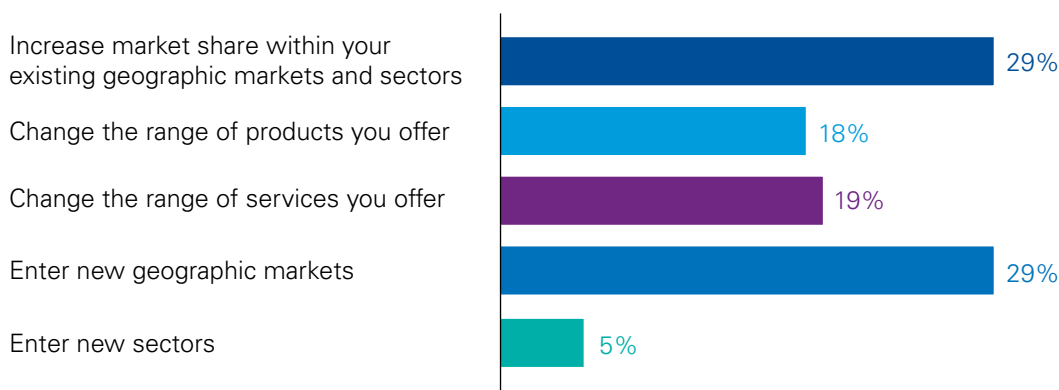
Looking for growth

With growth in the global economy expected to remain slow, metals and mining organizations are increasingly focused on growing their existing markets and product lines. Indeed, when asked what they will do to drive growth in today's economy, respondents cite two main strategies: growing their existing market share and entering into new markets. Less than one in five say they will develop new products and services to capitalize on a new or emerging opportunity.

"Many metals organizations are already fighting off fierce competition from lower-cost imports in their home markets and reduced demand from the emerging markets," notes Eric Damotte. "So while most metals organizations seem to believe they will grow their market share, the reality is that — without significant structural consolidation across the industry — they will need to steal it away from their competitors. Entirely new growth opportunities will be hard to come by."

Building market share

Which of the following is your top priority over the next 12 to 24 months?



Source: Forbes Survey 2016

Shifting the footprint

Our survey suggests that metals organizations will start to rebalance their global footprint in order to drive growth, respond to new trade barriers and protections, and — more importantly — improve their cost structures. In part, the data suggests a pullback from previously ‘hot’ emerging markets; 33 percent of those metals organizations with existing investments in Africa say they will likely reduce their investments over the coming years. One in five of those currently operating in the ASEAN region also expect to pull back somewhat.

At the same time, our data indicates that metals organizations are refocusing their investments into driving growth in their larger markets — China and the Americas in particular. Forty-six percent of metals organizations with existing investments in North America say they will ‘significantly’ increase investment in that market while 41 percent with investments in Central and South America (excluding Brazil) also anticipate significant investment increases over the next 2 years.

Interestingly, 57 percent of respondents with investments in China also say they will grow their investments significantly.

“With China continuing to struggle with massive overcapacity, particularly in the steel sector, we expect these investments to focus largely on shifting manufacturing operations towards higher-quality products to respond to China’s own shift towards value-added manufacturing,” notes Damotte. “China may make tons of steel, but very little of it is currently at the quality required by — for example — China’s growing automotive industry.”

While mining organizations are not able to shift their locations or their seams of ore, our experience suggests that miners are increasingly looking further afield for acquisitions that might improve their efficiency or diversity. “We will certainly see some M&A in the sector over the coming years, particularly in certain geographies where miners are looking to build scale,” notes Sharman. “However, there continues to be a significant bid/ask price gap as potential purchasers look to take advantage of the low-price environment to negotiate for lower valuations.”

Serving customers at a lower cost

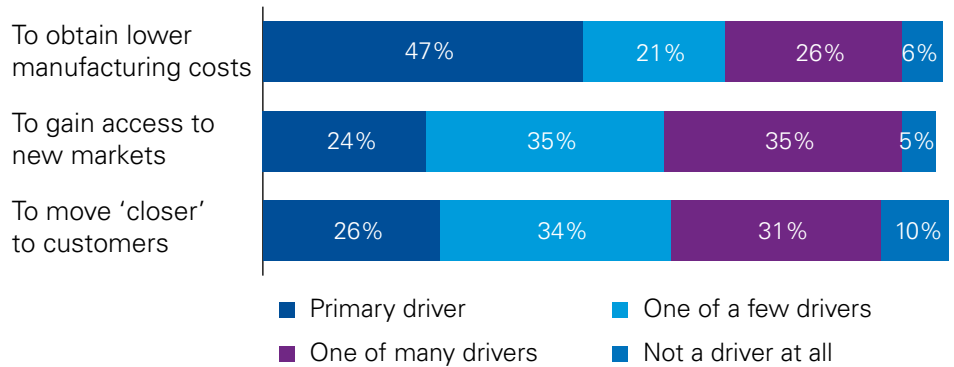
Interestingly, around a quarter of our metals sector respondents say that the primary driver behind their foreign investments is a desire to move closer to customers and to gain access to new markets, illustrating that metals organizations are planning to put some

investment behind their strategy to expand their market share in new markets.

However, the reality is that the most prevalent reason behind foreign investment in the metals sector continues to be a desire to improve the overall cost structure. Almost all — 94 percent — of our respondents report that their non-domestic investments are driven (at least in part) by a desire to obtain lower manufacturing costs.

Looking for better cost structures

How significant are the following drivers for your international investments?



Source: Forbes Survey, 2016

Note: Percentages may not add up to 100 due to rounding

“Metals organizations are certainly thinking about how to create the optimal footprint to match their expectations for future growth, but they are also highly focused on consolidating operations into lower-cost jurisdictions that provide

access to customers while helping manage margins,” notes Eric Damotte.

“Expect to see further asset restructuring as metals organizations start to execute on their investment strategies.”

What's the point?



Metals organizations want to expand market share and will adjust their investment strategies to achieve lower costs and improve access to customers.

What did metals executives say?

- Expanding existing market share and entering new markets are the top two strategies for growth.
- **94** percent are investing in overseas markets to obtain lower manufacturing costs.
- **26** percent are investing to move closer to customers.

How are leading metals organizations responding?

- Rethinking their global footprint to growth markets while taking advantage of opportunities for improved cost structures.
- Aligning their growth investments with expected shifts in customer footprints as key sectors — such as auto-body manufacturing — move closer to customers in lower-cost and growing destinations.

- Understanding the impact of new and emerging trade tariffs, barriers and protections within key markets and reassessing the make-versus-import equation.

How are leading mining organizations responding?

- Exploring opportunities to purchase high-value assets in new geographic markets to improve cost efficiencies or drive scale.
- Rigorously assessing the potential risks involved in new acquisitions to improve project certainty and confidence around earnings and cash flow.
- Continuing to reshape their portfolio of assets, products and markets to create the optimal footprint for sustainable growth.



Spotlight on copper



By Maritza Araneda

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Maritza has over 16 years of experience servicing clients in the mining industry in areas of financial reporting, audit and accounting matters, acquisitions and divestments, corporate governance and internal systems.

Copper miners will need to continue to be patient and focus on improving productivity as they ride out the continuing storm. 2016 started badly with copper prices hitting 6-year lows and production reaching record highs as projects kicked off in the boom years continued to come online.

At the same time, costs are now nearing record lows as copper miners continue to drive cost-containment measures, moving past the 'low-hanging fruit' to achieve more foundational and transformational cost structures. While the past 2 years have certainly been painful, they have also allowed copper miners to become more cost efficient, reining in bloated cost structure after years of rapid investment and growth.

Recognizing that prices may not return to significant growth any time soon, copper miners are now increasingly focused on long-term and sustained productivity improvements within their existing (particularly Tier 1) assets. Technology and automation will be a key enabler as mining companies focus on driving operational performance. And in some markets, copper miners will need to work closely with national and local governments dealing with local labor laws reforms in order to achieve more competitive levels of productivity.

Continued weakness in global copper prices has allowed consumers in the industrial sector to move from being price-takers to price-makers and aggressively negotiate prices. However, industrial demand in China, which accounts for approximately 45 percent of global consumption, is starting to look sluggish and somewhat reliant on stimulus measures from China.

Our view of the market suggests that prices will remain low through 2016, picking up somewhat in early 2017. Notwithstanding another economic crisis, we expect the market to return to a position of supply deficit sometime after 2019. In the meantime, we believe that copper miners will need to focus on riding out the storm, prioritizing initiatives that improve productivity and further reduce cost structures as they prepare for growth to eventually return to the market.

Spotlight on nickel



By Daniel Ricica

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Daniel has over 14 years of experience working in the mining industry with a focus on South American-based clients, principally in Brazil. Daniel has served on a large variety of Canadian and SEC-registrant mining clients.

Nickel producers are playing a game of 'wait and see'. Everybody is waiting for the first producer to cut production and start shutting down core assets. And everyone expects the first dominos will fall at smaller, higher-cost producers.¹

Over the past 2 years or so, the big nickel producers have been highly focused on getting back to their roots. Non-core assets — shipping fleets, logistics businesses and hydro plants, for example — have been sold off, with the proceeds largely channeled out to pay down some of the debt that was acquired during the last growth cycle (some of the largest deals of the upcycle — such as Vale's purchase of Inco in 2006, Sherritt International's acquisition of the Ambatovy nickel project in 2007 and Norlisk's purchase of OM Group, also in 2006 — were originally financed through debt instruments).²

Nobody wants to move to the 'next step' of shutting down assets. The challenge is that nickel mines are (generally speaking) much more expensive and much more complicated to turn off and on than other commodities. Extracting the nickel is one thing; managing the complicated refining process that is required to create high-quality nickel is another thing altogether and requires large integrated assets that nickel miners are reluctant to close.

While the large nickel producers have been waiting to see who will be the first to blink, the market has been somewhat eroded by lower-grade nickel — so-called nickel pig iron — that continues to depress demand,³ particularly from China where much of the nickel pig iron is currently produced. In addition, recently proposed environmental initiatives in the Philippines have caused prices to increase significantly in the past quarter.

In the meantime, the major nickel producers are working hard to rebalance their capital expenditure and shift their production towards lower-cost, higher-margin assets in the hope of avoiding the shuttering of assets. Hard decisions will need to be made as other lower-quality and higher-cost assets are reviewed for viability.

Interestingly, LME inventories — having reached historical highs recently — are now showing signs of falling, which should have an important impact on price. Thirty-day LME nickel warehouse stocks have decreased from approximately 394,000 tons to 377,736 tons as at mid-July.⁴

For the time being, nickel miners seem determined to stay on the course. But if the current long-term low-price environment continues, someone is going to need to swerve onto a new course. Ironically, that is the point where nickel prices may actually start to rise.

1. Source: <http://www.mining.com/big-miners-playing-game-of-chicken-as-marginal-producers-sink-below-break-even/>

2. Sources: http://www.nytimes.com/2006/09/25/business/worldbusiness/25canada.html?_r=0 <http://www.sherritt.com/English/Investor-Relations/News-Releases/News-Release-Details/2007/Sherritt-to-Acquire-Dynatec/default.aspx> <http://investor.omgi.com/phoenix.zhtml?c=82564&p=irol-newsArticle&ID=932751>

3. Source: <https://www.metalbulletin.com/Article/3558872/COMMENT-Indonesian-NPI-FeNi-will-keep-nickel-prices-depressed.html>

4. Source: <http://www.kitcometals.com/charts/lmewarehouse.html>

CHAPTER 03

Ambitious investments to drive growth

Metals organizations expect to pour significant investment into R&D over the coming years in an effort to drive new growth and open new markets. But with just 19 percent saying they will change their range of products and services, it seems that few organizations will find sufficient opportunities to put their R&D investment capital to work.

Big investment ambitions

Metals organizations certainly seem to believe that investments into R&D and innovation will drive their next wave of growth and performance. And respondents to our survey of metals executives suggest that they have significant ambitions for investment going forward.

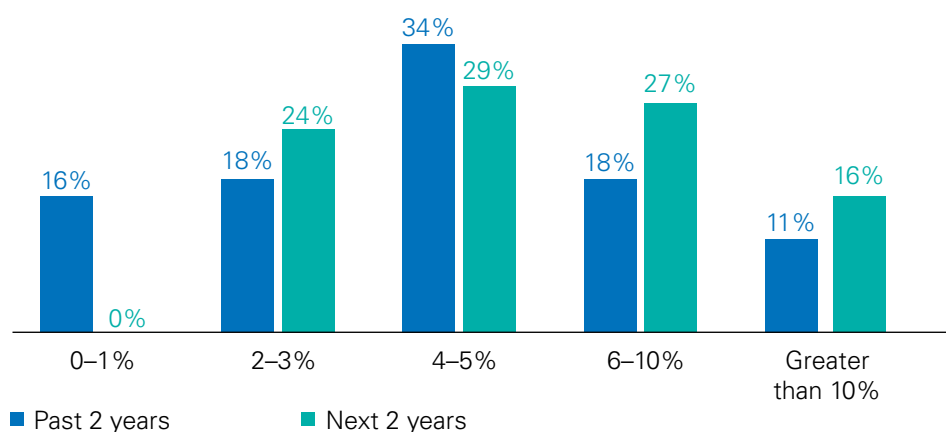
According to respondents, 43 percent of metals manufacturers will spend more than 6 percent of their revenues on R&D over the next 2 years. Amazingly, one in six say they will spend upwards of 10 percent of revenues on R&D in the

same period. And whereas 16 percent say they spent less than 1 percent of revenues on R&D in the past 2 years, all of our respondents say they will spend at least 2 percent of revenues on R&D going forward.

“Given the current market environment, it is unlikely that metals organizations will ultimately invest as much capital into R&D as they currently anticipate, particularly given the focus on cost cutting, but the ambition is certainly a welcome sign,” notes Eric Damotte. “In many cases, metals organizations are investing into ‘incremental’ R&D that responds to a specific customer requirement rather than pouring capital into developing new ‘breakthrough’ products or services.”

High expectations for significant investment

In your best estimate, what percent of revenue did your organization spend in the last 2 years on R&D/Innovation? What percent of revenue does it plan to spend over the next 2 years?



Source: Forbes Survey 2016

Note: Percentages may not add up to 100 due to rounding

Tapping into new technologies

What is clear is that metals organizations plan to channel significant investment towards developing and implementing new manufacturing technologies aimed at driving efficiency and improving performance.

Just over a quarter of metals respondents say they have already invested into additive manufacturing and 3D printing, and 27 percent say they will definitely invest more in the future. One in six say they have already invested into AI and cognitive computing solutions; a third (32 percent) say they will certainly invest more.

“Metals organizations recognize that — when the upcycle does return — they will need to be much more agile and efficient in order to drive profitable growth,” notes Eric Damotte. “Cognitive computing, AI and Data and Analytics will be critical in helping metals organizations take advantage of new growth opportunities as they arise.”

Maybe the greatest focus for R&D investment, however, seems to be towards robotics, with 42 percent of



respondents saying they will definitely invest in this area over the next 2 years. Around one in six have already invested in this area.

“While technology may not be a top agenda item for miners, there has been a lot of capital invested into applying technology to improve operational efficiency — self-driving

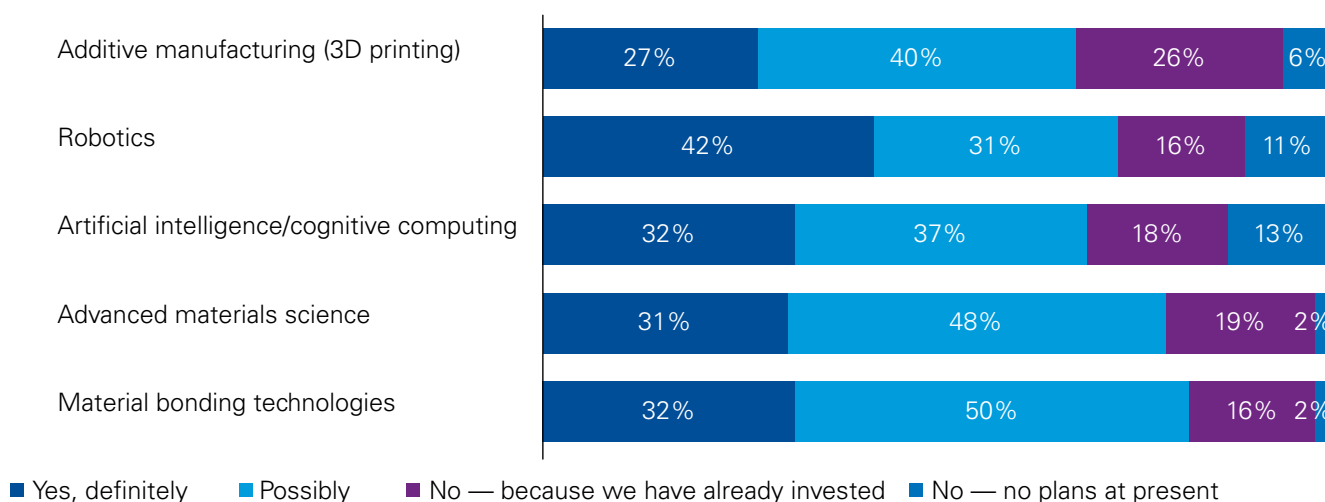
vehicles, real-time information about production and automation, for example,” notes Sharman. “However, given the current capital constraints, some technology initiatives seem to have been shelved for the time being.”

“There are only two ways to grow the bottom line — increase your market share with new and innovative products or

improve your efficiency and productivity,” notes Eric Logan, with KPMG in the US. “With fixed labor prices on the mining side and diminishing returns from labor arbitrage on the metals side, organizations are looking for opportunities to lower their costs and improve their uptime through automation and robotics.”

New tech, new opportunities

In which of the following manufacturing technologies will you be devoting a significant amount of investment in Research & Development funds over the next 12 to 24 months?



Source: Forbes Survey 2016

Note: Percentages may not add up to 100 due to rounding

What's the point?



Metals organizations hope to increase investment into R&D and many will focus on driving improvements through new manufacturing technologies

What did metals executives say?

- 43 percent expect to spend more than 6 percent of revenues on R&D over the next 2 years.
- 32 percent will invest into AI and cognitive computing in the next 2 years.
- 42 percent will invest significantly into robotics.

How are leading metals organizations responding?

- Investing into R&D to develop more sophisticated, value-added products to offset pricing pressures on commoditized products.
- Partnering with customers — and even competitors — to share

development costs and create new products that meet evolving customer needs.

- Investing into new technologies that create opportunities for greater operational efficiency and business flexibility.

How are leading mining organizations responding?

- Investing into technologies that improve automation, enhance efficiency and improve safety across the mining operation.
- Rethinking the technology investment roadmap to prioritize cash flow and margins while managing capital and costs.

Robotics in the metals sector



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Eric has nearly 20 years of experience working in the Industrial Manufacturing sector. His engagements focus on supply chain optimization, manufacturing strategy and operational effectiveness. Prior to joining KPMG, he led operations in facilities for primary manufacturers of both nickel alloys and steel alloys.

Have you hugged a robot today? You probably should: robots may end up saving your business.

With commodities and metals prices at (or near) historical lows, everyone in the metals and mining sectors is focused on improving productivity, driving out costs and eliminating downtime. And many are now seeing diminishing returns from their traditional cost and efficiency initiatives.

It is not surprising, therefore, that metals executives say they will invest heavily into robotics to drive their growth agenda. Automation and robotics can help reduce labor costs, drive efficiency and productivity, enhance safety and improve quality across the metals and mining sectors. Better yet, the returns on robotics don't diminish over time — robots do not expect wage increases, they do not slow down with age, and rarely do they ever make mistakes.

At the more modern and sophisticated mills and mines around the world, robots are already hard at work. In the primary metals sector, for example, robots are already being used for sample testing; they are watching for and responding to signs of slag; they are moving transfer cars across the mill floor; and they are increasingly making key decisions in the programmable logic controller (PLC) process.

The further along the finishing process you move, the greater the impetus of robotics. Those creating slabs of steel, for example, may use robots to cut, move and test the quality of their product. Those that are involved in the finishing process may use robots for everything from milling and welding through to inventory and logistics.

All signs suggest we are now on the cusp of a new age of automation in the metals and mining sectors. Indeed, once organizations start to combine robotics with the masses of data they have at their disposal (both inside and outside of the organization), we expect to see the value of automation and robotics grow exponentially.

The robots have arrived. And they very well may be the savior of your business.



Working together to improve visibility and predict demand

With metals and mining organizations suffering significant pricing pressures and intense competition, it is clear that the fortunes of both sectors relies on future economic growth. In the meantime, however, mining organizations and their metals customers could be doing more to improve visibility and share demand signals across the supply chain.

Preparing for growth

With metals executives voicing some confidence in their potential for growth over the next 2 years, our survey suggests that some are now starting to consider whether their supply chain — mining organizations included — is prepared to support their growth objectives. Given the high levels of overcapacity in almost every mining sector, it is perhaps not surprising that almost a quarter believe that their supply chain is ‘very’ ready for growth.

“For the most part, mining organizations are doing everything they can to keep

capacity online, waiting for growth to return and for prices to start to rise once again,” notes Sharman. “Metals executives should have no concerns about their ability to source raw materials — for the time being, at historically low prices.”

However, our survey suggests that metals executives are concerned that supply chain failures could impact their growth objectives. In fact, 82 percent of metals executives in our survey say that supply chain failure is a risk and more than a third say it is a significant risk.

Concerns about supply chain failure

What do you see as your organization’s greatest risks in advancing its growth agenda over the next 12 to 24 months?



Source: Forbes Survey 2016

“Metals organizations are still focused on reducing costs and improving performance, but they want to know that — when growth does return — they can move quickly and with agility to capitalize on the opportunities as they appear,” adds Damotte.

Improving visibility to improve confidence

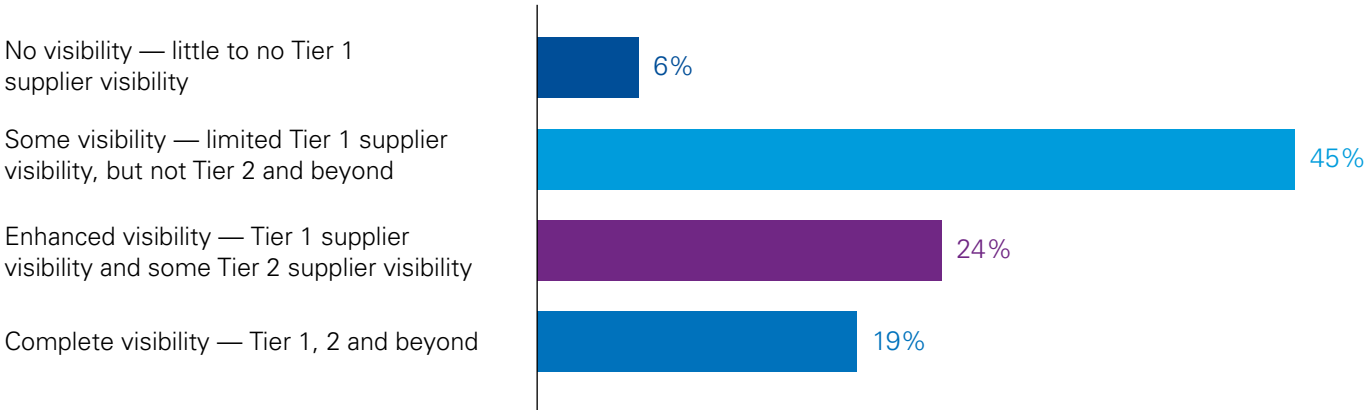
One of the greatest challenges facing both metals and mining organizations is a lack of confidence in future demand. However, our survey illustrates that there is little coordination of demand

signals and visibility between metals organizations and their suppliers. Just one in five metals executives report complete visibility across their Tier 1 suppliers, Tier 2 suppliers and beyond. The majority (51 percent) say they have only limited visibility into their supply chain.

“If metals and mining organizations could better share demand signals, inventory levels and growth plans, both sectors would be in a stronger position to negotiate prices and invest in future capacity,” notes Sharman. “Complete visibility may not ever be entirely possible, but greater coordination and collaboration is certainly a worthy goal.”

Lacking visibility

How much visibility of supply and capacity information do you have across your suppliers and logistics partners?



Source: Forbes Survey, 2016
Note: Percentages may not add up to 100 due to rounding

Technology to drive productivity and growth

According to our survey, metals organizations are focused on investing into technologies and systems that help them improve efficiency and drive productivity. Almost three-quarters (72 percent) of metals executives say they have some plans to invest into Internet of Things (IoT) technologies; 63 percent say they are considering investing into purchase-to-pay

automation. Perhaps not surprisingly, demand sensing technologies were cited as the third most likely area for investment over the next 2 years.

“Metals executives are looking at all options for improving efficiency and driving productivity improvements in this low-price, high-competition environment,” adds Damotte. “From technologies with proven applications in the sector like process automation through to newer advances such as IoT, metals — and increasingly mining — organizations are starting to adopt and implement new technologies.”

What's the point?



Metals organizations are worried about the potential for supply chain failures but most lack complete visibility into their supply network.

What did metals executives say?

- **23** percent believe that their supply chain is ready to support their growth objectives.
- **82** percent say supply chain failure is a potential risk to growth.
- **72** percent will invest into IoT technologies.

How are leading metals organizations responding?

- Exploring opportunities to improve transparency across their supply chain, both upstream and downstream.
- Implementing new technologies and applying Data and Analytics to identify opportunities to improve

supply chain efficiency and flexibility.

- Improving the sharing of data between metals customers, suppliers and operations through new IT platforms and tools.

How are leading mining organizations responding?

- Assessing the sustainability of price increases and demand rises to adjust production accordingly.
- Learning how to improve supply chain efficiency and visibility from other manufacturing sectors such as automotive.
- Shipping the supply chain focus from development to operations.

Spotlight on gold



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Daniel has worked extensively with global listed gold mining companies in South Africa. He is an assurance partner focused in the energy and natural resources sector working with clients in the exploration phase, development phase and production phase.

The gold price has shown recent strength, breaking the US\$1,300 mark. Speculation is that this is due to the elections in the US and uncertainty in Europe after Brexit. Gold miners now face a conundrum: When do they start investing again in growth projects and how sustainable is the current gold price for forecasting purposes?

The big question is when to start investing into new assets. If prices were to remain above US\$1,300 an ounce, most gold miners would naturally start to shift their plans towards growth. The difficulty is that, with prices having settled below US\$1,200 an ounce for most of 2015, few gold miners now have the cash available to start up new major capital projects.

Miners will be looking for a mix of equity and debt funding for new capital projects. But the investor pool has changed somewhat over the past few years. Most banks and traditional gold sector investors are still feeling burnt by the 2012–2013 fall in the gold price and are increasingly concerned about the sector's history of project over-runs and long-term returns. Emerging market investors have become increasingly sophisticated, demanding quicker and higher returns on longer-term projects. Gold miners will want to make sure the projects they bring to the capital markets are high-quality, high-return and well-planned.

While the above is all true for gold producers whose costs are based in US dollars, there is a group of gold majors — particularly from South Africa and Australia — who are currently benefiting from the gap between US dollar-denominated revenues and local currency costs. With significant new cash flow resulting from exchange-rate movements and USD strengths, these players should have an easier time securing the capital required to develop new operations and secure new assets. The challenge for these miners is to keep inflation down while maximizing production.

For now, most gold producers are using the uptick in prices over the past 6 months to start reinvesting in on or near mine exploration within their existing assets as well as recovering working capital positions. Some new capacity should therefore come online before the end of 2016 with further liquidity demonstrated in the industry. But with prices continuing to fluctuate between US\$1,200 and just above US\$1,300 an ounce, gold producers would be well advised to build some flexibility into their plans that allows them to quickly refocus investment towards higher-quality assets that make money at a lower cost.

Miners need to start thinking about the long-term impact and benefits of technology. Automation, Data and Analytics and the Internet of Things may not be widely adopted in gold mining operations today, but those able to integrate these technologies should unlock significant cost savings over the long-term.

Spotlight on platinum



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Alwyn joined KPMG South Africa in 1988 and became an audit partner in the Energy and Natural Resource group in 1998. He provides audit and advisory services to mining and oil and gas clients. He also currently leads the firm's focus to identify and manage priority companies where we can add the most value and grow our business.

Platinum miners are in deep survival mode, struggling through a perfect storm and fighting hard to balance their portfolios and cost structures until growth returns to the sector. A fair number may not survive.

Let's be clear: Platinum is of little interest to metals organizations from a strategic standpoint. But it is an important commodity for the automotive sector (platinum and palladium are used to reduce carbon emissions in vehicles, something regulators and policy makers are increasingly keen on). And the challenges faced by the sector today provide an interesting case study for any organization facing a protracted low-price environment.

On face value, the challenges facing platinum miners are not dissimilar to those flowing through the wider mining industry — slow economic growth (particularly in the emerging markets), oversupply, high inventory levels and increased regulatory focus on environmental targets all create challenges for platinum miners.

However, platinum miners also face new and emerging risks. Recycled platinum, largely from cars now being retired, has eaten away about 20 percent of the total platinum market. At the same time, some car manufacturers are investing into researching lower-cost alternatives or different mixes of platinum and palladium. And with electric cars now starting to make up a greater share of automakers' sales (Volkswagen expects electric vehicles to make up 25 percent of their total sales by 2025), few are willing to make any long-term predictions on the platinum price going forward.

The more immediate challenge, however, is that cost cutting and productivity improvements in the sector have started to reach a point of diminishing returns. And that has led a growing number of miners to start to close their higher price shops and reallocate resources to their more economical assets. But mining executives are also trying to balance cash preservation and reduced capital expenditure against the potential for longer-term growth, ensuring they are ready when the market returns. Only time will tell how many will be around to see the day.

Spotlight on aluminum

When aluminum prices jumped almost 15 percent in early 2016, many aluminum producers wondered whether they had moved too quickly to reduce capacity and slow production. Some started to consider re-firing their now idle smelter capacity to gear up for higher prices.

Yet with little sign of significant demand growth in China or the developing world, these price gains seem fragile. Any increase in capacity, therefore, may erode the recent price gains as quickly as they were achieved. Recognizing this threat, most analysts now expect prices to remain steady or even fall somewhat until around 2018.

For aluminum producers, the challenge will be to maximize margins without increasing volumes. Continued efforts to soak up existing stocks will help. So will the announced moves by China's government to encourage domestic producers to slow sales. Low energy prices for natural gas and coal will also help maintain margins for many producers.

Growth opportunities do exist. Indeed, with new, stronger and more lightweight aluminum products already creating significant competition for other metals products — particularly steel — aluminum producers will likely continue to focus on investing into R&D in order to create new market opportunities focused on the automotive, aerospace and consumer products sectors.

With innovation and continued restraint in capacity increases, aluminum producers should see steady — and more predictable — prices over the coming years. Those that are able to move themselves up the value chain and innovate with their customers should enjoy higher margins and be able to negotiate longer-term contracts. But should capacity return in a significant way, all signs suggest that aluminum prices may remain depressed for some time.



In their words: **Severstal sees advantages in vertical integration**

Do vertically integrated steel manufacturers enjoy an advantage in today's economy? To find out, we sat down with **Andrey Laptev, Head of Corporate Strategy at Severstal**, one of the world's largest vertically integrated steel producers.

Severstal is an integrated steel, iron ore and coal producer operating in Russia's northwest region. In 2014, the company produced over 11 million tons of crude steel and earned more than US\$8 billion in revenues.

What is the advantage of running a vertically integrated steel organization in today's economy?

Given the tight competition in the steel sector, we see a distinct advantage to controlling the entire value chain for steel production, from iron ore and coking coal through to slabbing and finished products. This means that we are able to optimize our raw material inputs in real time, across the entire value chain, to quickly respond to different customer demands and changing market environments in different segments.

In your opinion, should all steel producers be focused on becoming more vertically integrated?

Not at all. In fact, the main reason that vertical integration works so well for Severstal is geography. Russia is one of the few countries that is blessed with both high-quality iron ore and coking coal and our operations sit at the nexus between these assets and our main customer channels. So we enjoy significant logistical and economic benefits that come from managing a tight, short and low-friction value chain. The point is that not every vertical integration makes economic and strategic sense in our industry.

Do you see vertical integration as a benefit or a risk in today's challenging environment?

I think that we have enjoyed massive benefits from our unique geographic situation and integration. Today, we are widely considered to have the lowest costs among all steel producers in the world. And our EBITDA (earnings before interest, taxes, depreciation and amortization) margins are the highest in the world. Of course, our model also means that we are often more exposed to shifts in steel, iron ore and coking coal demand, which increases our systemic risk overall. But our ability to optimize our value chain in real time as fluctuations occur means that we are well placed to manage that risk.

Do you attribute your success to your vertical integration?

Our geographic benefits and our integrated value chain are certainly key. But I think one of our greatest advantages is our focus on culture. We believe that success comes from fostering a culture of continuous improvement that is shared by all employees — from the shop floor to the top floor. And we focus on delivering the right instruments, the right training and the right attitudes to help our people drive continuous improvement across our organization. I think that is one of the great catalysts of our success.

Key takeaways

What's the point?

Confidence in the global economy is low and metals organizations are ramping up their focus on cutting costs and performance improvements.

Metals organizations want to expand market share and will adjust their investment strategies to achieve lower costs and improve access to customers.

Metals organizations hope to increase investment into R&D and many will focus on driving improvements through new manufacturing technologies.

Metals organizations are worried about the potential for supply chain failures but most lack complete visibility into their supply network.

How are leading metals manufacturers responding?

- Working with national governments and regulators to advocate for greater consolidation across the sector and the reduction of structural capacity in key markets.
- Focusing on products where they enjoy clear market or cost advantages in order to reduce the impact of commodity competition from lower-cost producers.
- Reinvigorating their efforts to identify and leverage efficiencies across the entire product portfolio.

- Rethinking their global footprint to prioritize growth markets while taking advantage of opportunities for improved cost structures.
- Aligning their growth investments with expected shifts in customer footprints as key sectors — such as auto-body manufacturing — move closer to customers in lower-cost and growing destinations.
- Understanding the impact of new and emerging trade tariffs, barriers and protections within key markets and reassessing the make-versus-import equation.

- Investing into R&D to develop more sophisticated, value-added products to offset pricing pressures on commoditized products.
- Partnering with customers — and even competitors — to share development costs and create new products that meet evolving customer needs.
- Investing into new technologies that create opportunities for greater operational efficiency and business flexibility.

- Exploring opportunities to improve transparency across their supply chain, both upstream and downstream.
- Implementing new technologies and applying Data and Analytics to identify opportunities to improve supply chain efficiency and flexibility.
- Improving the sharing of data between metals customers, suppliers and operations through new IT platforms and tools.

How are leading mining organizations responding?

- Maintaining a strong focus on capital and capital deployment to prioritize cash flow returns over increased production volumes.
- Becoming more decisive about managing their balance sheets to focus on free cash flow generation.
- Improving the discipline around the management and use of their resources and ore bodies to focus on higher-growth or higher-margin commodities.

- Exploring opportunities to purchase high-value assets in new geographic markets to improve cost efficiencies or drive scale.
- Rigorously assessing the potential risks involved in new acquisitions to improve project certainty and confidence around earnings and cash flow.
- Continuing to reshape their portfolio of assets, products and markets to create the optimal footprint for sustainable growth.

- Investing into technologies that improve automation, enhance efficiency and improve safety across the mining operation.
- Rethinking the technology investment roadmap to prioritize cash flow and margins while managing capital and costs.

- Assessing the sustainability of price increases and demand rises to adjust production accordingly.
- Learning how to improve supply chain efficiency and visibility from other manufacturing sectors such as automotive.
- Shifting the supply chain focus from development to operations.

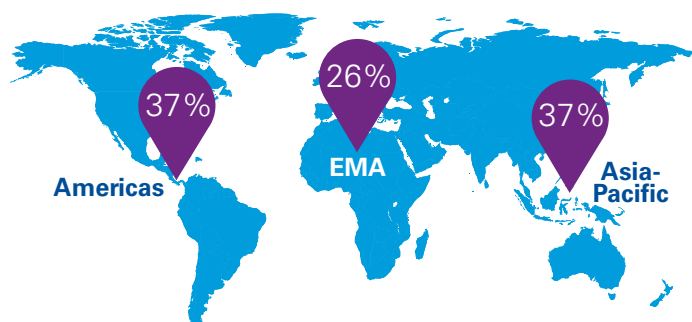
About the survey

This year's 'Limited Edition' Metals and Mining Outlook combines data from a survey of metals executives around the world with the insights and practical experience of KPMG's global network of metals and mining professionals.

The survey, part of KPMG's *2016 Global Manufacturing Outlook*, was conducted by Forbes Insights on behalf of KPMG in early 2016. Sixty-two senior metals executives responded to the survey, providing a unique view into the challenges and opportunities facing the metals sector today. Around a quarter of respondents are based in Asia-Pacific, with the remainder evenly split between the Americas and Europe.

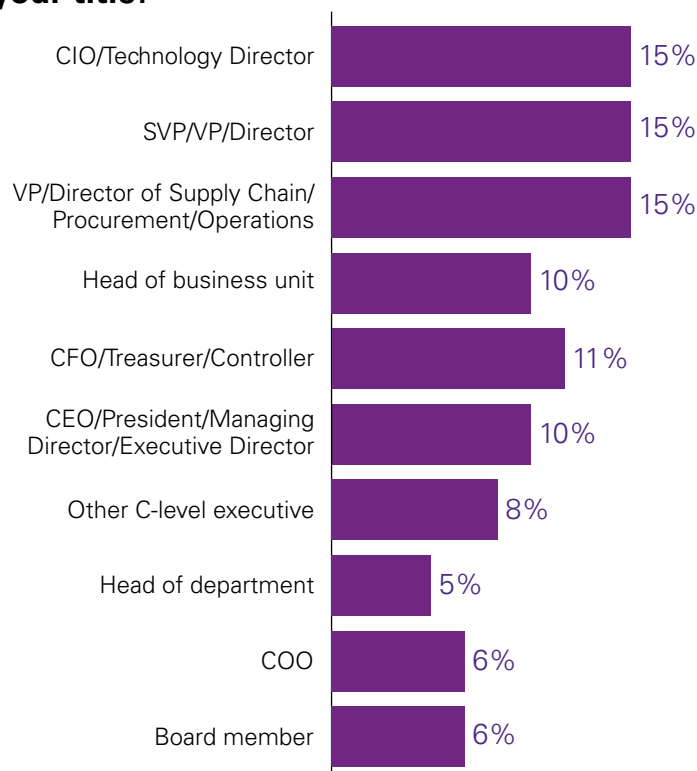
To provide valuable context to this data, we spoke with KPMG's global network of metals and mining leaders, who provided valuable insights and practical tips based on the data and their view of the market. Supported by insights and forecasts for key mining segments, this report offers a unique outlook on the metals and mining industries going forward.

Where are you personally located?



Note: Percentages may not add up to 100 due to rounding

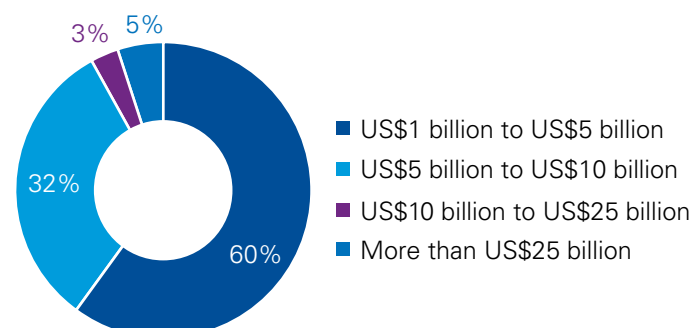
Which of the following best describes your title?



Source: Forbes survey 2016.

Note: Percentages may not add up to 100 percent due to rounding.

What are your organization's global annual revenues?



Note: Percentages may not add up to 100 due to rounding

How KPMG's Metals practice can help

As metals organizations look for growth and sharpen their focus on costs, leading organizations are working with KPMG's global network of more than 1,900 metals professionals to identify new opportunities, leverage innovations and drive sustainable growth.

KPMG firms take a holistic view of the challenges facing each client and — leveraging our unique position in the market, our global reach and our multidisciplinary approach — we tailor the right set of services and gather the right set of capabilities to meet each client's unique needs.

With our global industry knowledge and involvement in key industry events, we believe we are truly the advisors of choice to the Industrial Manufacturing and Metals industry.

KPMG's Metals teams offer proactive, forward-thinking services to leading metals organizations, helping them take advantage of the sector's growth potential and overcome the main issues and challenges within the sector.

Our services focus on helping dynamic organizations address the major issues and market priorities facing the metals industry, including:

- Business model transformation
- High-growth market strategies
- Market entry and expansion
- M&A and transaction services
- Corporate finance and valuations
- Private equity investment



The growth agenda

- Supply chain and distribution solutions
- Procurement transformation
- Improving operational efficiencies
- Finance transformation
- Internal improvement and sourcing advisory
- R&D management strategies



Cost and competitiveness

- Enterprise risk management
- IT advisory solutions
- Governance, reporting and regulatory services
- Debt advice and securitization
- Global tax and transfer pricing services
- Sustainability and the environment



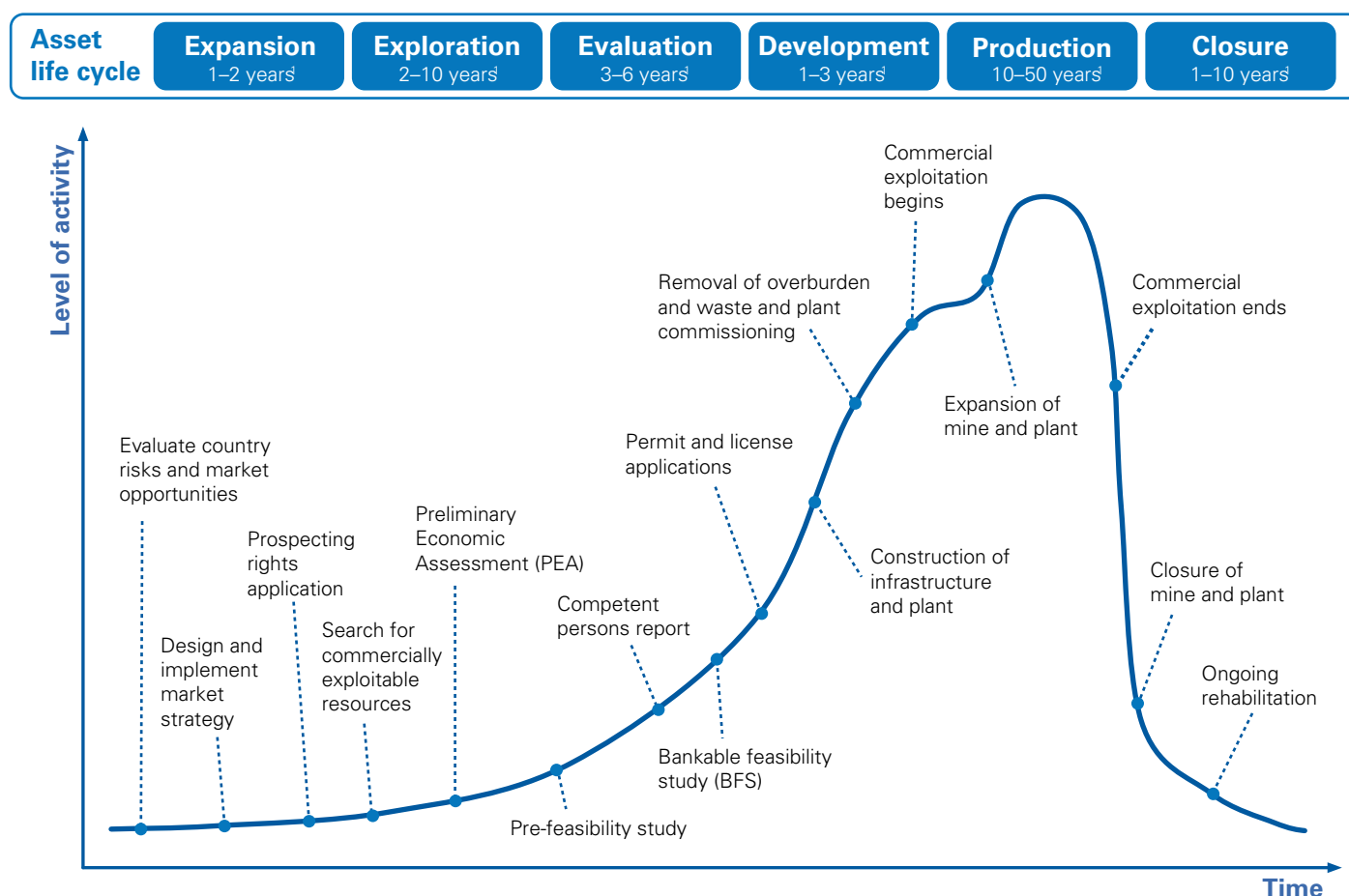
Risk, governance and regulatory matters

KPMG's Global Mining Institute

The Global Mining Institute was established in 2013 to be a worldwide knowledge-sharing platform detailing insights into current issues and emerging trends. Mining industry professionals have access to valuable industry thought leadership, events and webcasts. A regional focus provides decision-makers tailored insight within the Americas, Asia-Pacific and the Europe, Middle East and Africa regions.

KPMG member firms offer global connectivity and are composed of individuals with extensive practical experience in the mining industry who work together. As a client, you will get access to the latest industry thinking, skills, resources and technical development from a team that has local knowledge, backed up by in-depth global expertise. Our firms are continually building our understanding of global trends and developments by sharing observations and insights with you.

KPMG has in-depth understanding of the mining asset life cycle



Related industrial manufacturing and mining publications



Global Manufacturing Outlook 2016 (May 2016)

The Global Manufacturing Outlook report provides a comprehensive overview of the global manufacturing sector, along with observations and insights from KPMG member firm partners and clients and is based on a survey of 360 industry executives from around the world. The GMO explores significant areas such as growth strategies, entering new markets and products and services, R&D, technology, supply chain and more. The report finds that manufacturers are highly focused on growth, and that many expect to be very aggressive in the pursuit of their growth objectives.



Global Aerospace and Defense Outlook (July 2016)

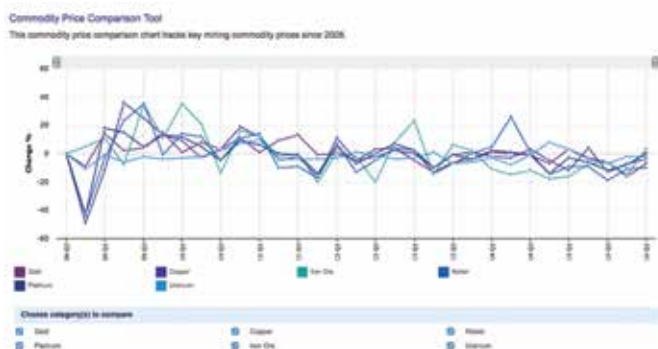
This annual publication reviews the key findings from KPMG's Global Aerospace and Defense Outlook 2016, based on a survey of A&D organizations around the world. The report focuses on the challenges, key issues and future strategies facing the industry.



Commodity INSIGHTS Bulletin series

A series of bulletins focusing on key mining commodities. Each bulletin is aimed to provide insight into trends, issues and changes within key mining commodity sectors.

kpmg.com/miningcommodities



Commodity Price Comparison Tool

This online tool allows you to compare commodities price data from 2008 to present and see correlation trends within the market.

kpmg.com/commoditypricing

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