Opportunities to enhance capital productivity

Mining and metals megaprojects

EY

Building a better working world

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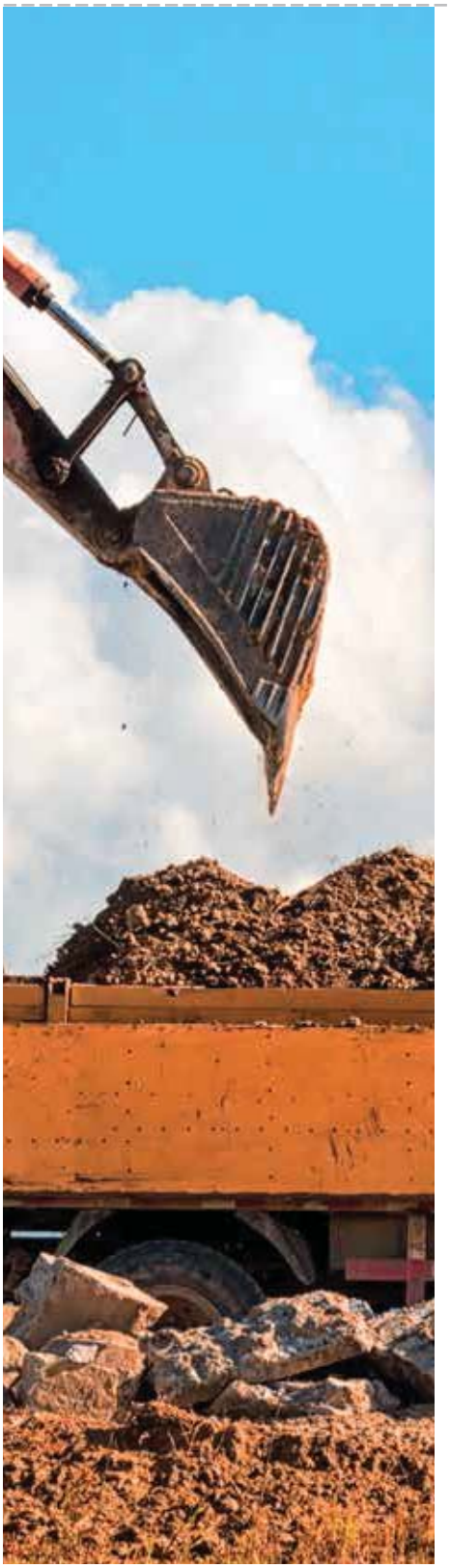
Why spending millions in up-front planning, engineering and design is not driving improved predictability and control



Cost and schedule control: a key risk and major opportunity

The productivity of invested capital is a key issue for CEOs across the global mining sector. This focus reflects the significance, and the challenge, of achieving predictable return on investment outcomes when delivering complex multibillion dollar asset developments. New data captured through a recent global study by EY has revealed that overruns to the sanctioned budget and schedule commitments are the norm with our global megaproject sample group, showing an average budget overrun of a staggering 62%.

With projects of this scale, every overrun impacts total shareholder return, ROCE, capital productivity, corporate performance and strategic outcomes. In turn, overrun risks are driving an unprecedented level of scrutiny on the project, program and portfolio disciplines of cost and schedule control.

average budget overrun on megaprojects

Based on our study results, EY has developed a root cause model to analyze the drivers of overruns and capital productivity impacts. Some of the findings are predictable; others are surprising. Overruns occur despite large investments by mining and metals companies to enhance up-front engineering practices and increase delivery maturity. We believe that there are overlooked opportunities to significantly enhance delivery control.

We have identified three critical enablers for preventing cost and schedule overruns that are often de-prioritized and underinvested:

- **Flagging of emerging risks:** implementing governance, and reporting frameworks with lead indicators that reliably flag emerging risks while they can still be efficiently mitigated
- **Adequate cost and time contingency:** allocating cost and time contingency across the projects' life cycle to avoid risk-driven budget and schedule variances
- **Scenario planning:** enhancing the value of contingency planning through enhanced delivery scenario planning

Complemented by a broad uplift in delivery-discipline maturity, these enablers have real potential to significantly improve capital productivity realization.
In this paper, we will:

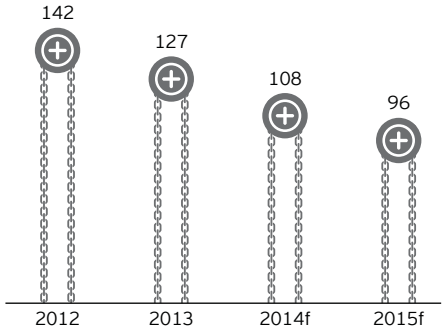
- Explore the surprising findings of our study
- Propose a root cause model
- Examine key considerations in applying these critical enabling techniques

Capital megaprojects: declining but still massive

Falling commodity prices and a rising supply surplus are ushering in a period of restraint in capital project investment across the global mining and metals sector. Numerous high-profile projects have been scrapped, shelved or sent back for re-planning, with a recent study identifying aggregate cuts in capital expenditure of more than US$27b since January 2012. Following a robust peak in growth of 27% in 2012, mining and metals capital spending declined by 10% in 2013 and is expected to have dipped by a further 15% over 2014.[1]

Despite the reduction in capital spending, projects continue to be developed because of the long lead times of approvals and construction and the need to prepare the next wave of supply to be available as the cyclical upswing inevitably occurs. For organizations in the mining and metals sector, the funding, planning and delivery of capital projects is core business and a key element of effective business strategy that must continue throughout the economic cycle.

Global mining and metals capex (US$b)



Source: EY analysis; Engineering and Mining Journal's annual survey of mining investment; "Riding the rising tide of global growth," *Deutsche Bank*, 19 February 2014, via Thomson One.

1. "Riding The Rising Tide of Global Growth," *Deutsche Bank research*, 19 February 2014, via Thomson One.

Drilling down to the core issues and causes

Scarce capital driving a focus on capital productivity

The competition for capital project funding within organizations is now fiercer than ever. With fewer projects progressing through investment gates, a stronger focus has been put on portfolio prioritization to ensure that projects that do proceed deliver the gains in capital productivity and strategic outcomes, which are desired and required by boards and investors.

Capital productivity definition

"Capital productivity" is a measure of the effectiveness and efficiency of capital investments in generating operational outputs, and is defined by the Australian Bureau of Statistics as the "ratio of output to capital input." In short, capital productivity assesses "value for money" on a multibillion dollar scale.

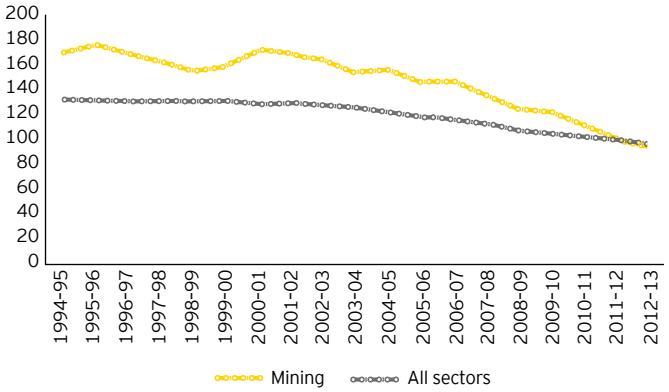
There are two key levers for companies to enhance their capital productivity performance:

1. Minimized and predictable "input" through controlled project delivery
2. Maximized and sustainable "output" through earlier asset operationalization (e.g., schedule acceleration) or operational efficiency (e.g., improved equipment availability and utilization processes and skills)

Successful capital mining projects drive enhanced capital productivity outcomes by addressing both these levers – "inputs" are controlled and "output" efficiency is designed-in simultaneously. In contrast, at-risk capital projects commonly face challenges of both "input" inflation (such as cost and schedule variance) and compromised "output" performance (such as operational impacts of poor design). Capital productivity is a two-part relationship that can work to a project's advantage or detriment.

An issue of great concern to executives globally is that productivity, on both volume and cost basis has been declining significantly in the mining and metals industry since 2000. This trend was highlighted in EY's recent report, *Productivity in mining: now comes the hard part*, and reflects the legacy of prioritizing production growth and revenue uplift during an unprecedented boom in commodity prices – a "volume first" approach. Decisions resulting in productivity trade-offs may have been commercially viable during the boom period but are often no longer acceptable currently. The capital productivity index graph shows the consistent trend of declining capital productivity over the past two decades in Australia.

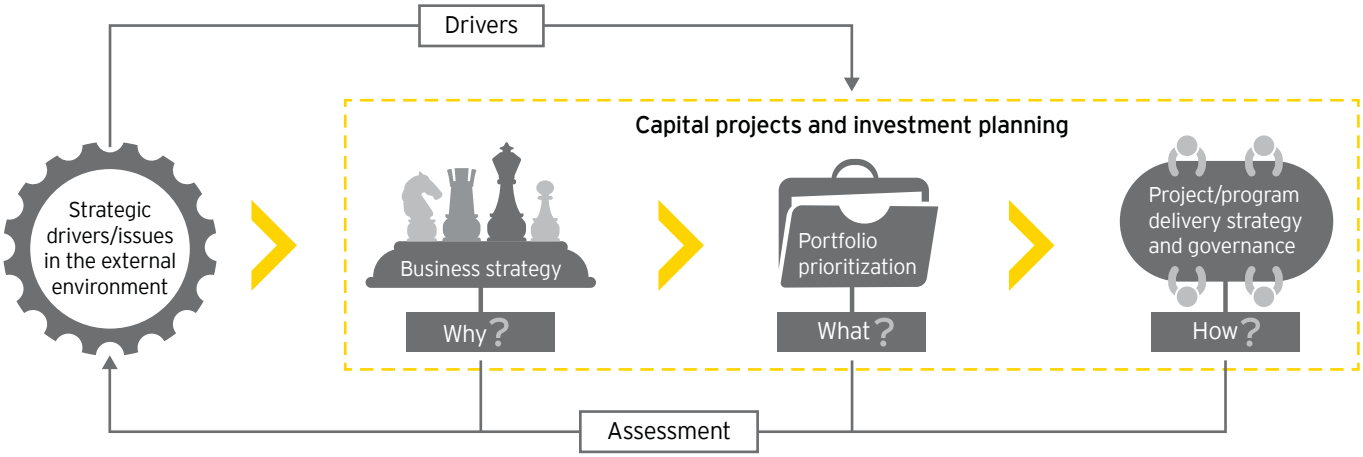
Capital Productivity Index



Source: Australian Bureau of Statistics, 19 February 2014, via Thomson One.

Strategic and external environment changes, such as commodity price movements, can have direct and significant impacts on capital projects and investment planning. EY's view is that there is a dynamic relationship between changing external drivers, business strategy formulation, portfolio prioritization and project delivery strategy and governance design. During each of these steps, capital delivery organizations benefit from regularly realigning to the external environment and corresponding strategic drivers.

EY's view of the dynamic relationship for capital project and investment planning



- Commodity prices
- Economic conditions
- Technological evolution
- Political environment

- Setting business direction for sustainable competitive advantage

- Prioritizing projects by allocating capital in-line with strategic objectives

- Delivery strategy and governance designed to achieve capital productivity in line with corporate risk tolerance and external drivers

In the mining and metals sector, executives must balance potentially volatile external drivers with large-scale investment profiles and long-term delivery time frames. These organizations must be sufficiently agile to adapt to emerging factors and external conditions and continually reassess their capital portfolio and delivery strategy decisions. Exceptional results are achieved not only by ensuring successful project delivery, but also by ensuring projects remain aligned to business strategy throughout their investment and delivery life cycle.

The devastating impact on capital productivity

A recent EY study of projects in the mining and metals sector (October 2014) surveyed 108 projects at various stages across the investment and project delivery life cycle (proposed, awaiting Final Investment Decision (FID), in construction or ready to "Go Live"). Cumulatively, these projects represented global investments of US$367b, with each individual project exceeding US$1b and relating to the development of copper, iron ore, gold, coal, nickel and other commodities.

> Despite an estimated US$20–$55b* being spent globally in up-front engineering and design, average budget overruns were 62%, and 50% of projects were reporting delays.

*Projected up-front engineering and design spend in the typical range of 5%–15%

Our research found that the majority of these projects were delayed and/or over budget when measured against the initial estimates made during the early stages of the project life cycle, such that:

- 69% of surveyed projects were facing cost overruns with an average cost overrun of 62% above initial estimate (where cost data was available).
- 50% of projects were reporting schedule delays even after remedial acceleration initiatives had been applied.

Our analysis found that cost and time overruns were not correlated to whether a project had reached FID, nor were they restricted to a particular commodity or region. Of all the global regions reviewed, Oceania experienced the highest level of average budget overruns. Contributing factors across the sample set included:

- Labor costs
- EPCM and contractors
- Industrial relations
- Overvalued currency
- Logistical challenges of remote geographies

Geographic distribution of investment

Source: EY research and analysis
Note: This denotes the net amount of investment in the pipeline as at October 2014.

The impact of overruns

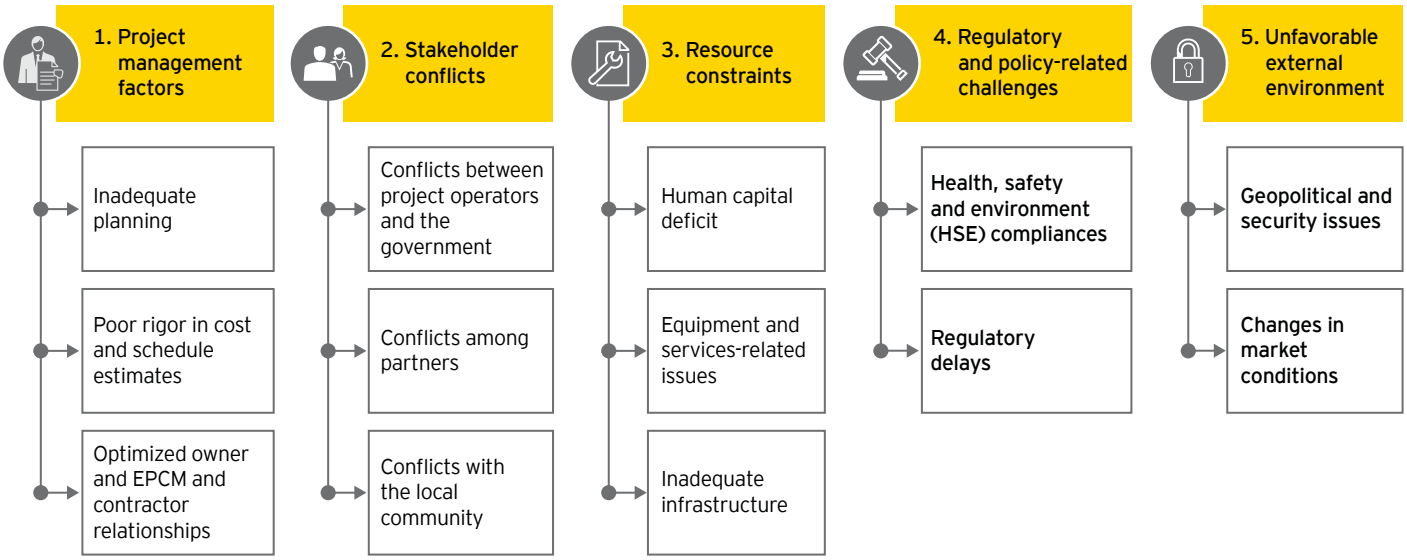
Higher commodity prices in the past few decades have concealed the impact of declining productivity as well as the consequences of budget and schedule overruns. Many of the analyzed projects were approved when commodity prices were on a trajectory cyclical upswing. Recent volatility, and a downward trend, in commodity prices have rendered many of these projects high on the cost curve, with some performing above the marginal cost of production, given the current prices.

As leaner corporate profit margins, constrained capital availability and greater investor demand for capital discipline continue to be key decision-making considerations, executive appetite for cost and schedule variations is low. Mining and metals organizations must understand the factors that lead to project schedule and cost overruns, and adequately plan to successfully manage and deliver their projects. Continuing the current trend of poor capital productivity, performance is not consistent with adequate returns into the future.

Many of the projects studied that experienced overruns were flagship projects for major global mining and metals companies. A number of these projects made media headlines due to their underperformance. For example:

- **A major copper and gold operation in Central Asia:** The National Finance Minister had been quoted as saying: "No one understands why the project has gone US$2b over budget."
- **A major iron ore project in Brazil:** To date, the project has experienced an overrun from the initial estimate of approximately 690%. The chief executive officer of the company has gone on record to say that "they are working very hard" to ensure no more delays or cost overruns on the project.
- **A Brazilian megaproject:** This project saw capital costs escalate from US$3.6b in 2007 to US$8.8b in 2013. Media sources have described this investment as one of this organization's "most significant failures of recent years."

What's causing the problem?



Based on our analysis of mining and metals projects, we have identified five key causes of budget and schedule overruns across the current global portfolio of mining and metals investments. Against these key causes, a wide range of observations and learnings were captured during the study:

1. **Project management factors:** Inadequate front-end planning and missed opportunities to establish key project management disciplines, such as governance, risk management and project controls, in the early stages of the project can significantly affect project performance across the delivery life cycle. Extending on from this is also the early choices made by owners in selecting EPCM and contracting partners. With many failing to establish the optimal relationships, accountabilities and contracting incentives early on, manifesting in disputes and project re-mediation during subsequent phases where the cost of time and re-work is at its highest. In the absence of standardized process and governance disciplines, significant delivery practice disparities may emerge, reducing performance transparency, planning effectiveness and delivery control. Poor cost- and schedule-estimation-methodology design, optimism bias and insufficient allocation of risk-based contingency are all common causes of future cost and schedule variations. Inadequate "owner" team supervision and control over delivery partners can lead directly to commercial disadvantage, mismatched expectations and high levels of change request-driven interaction.
2. **Stakeholder conflicts:** Managing the expectations and needs of a diverse stakeholder group is challenging, but exponentially more efficient than resolving conflicts arising from lack of engagement. Achieving mutually acceptable consensus between delivery partners regarding commercial terms, ownership structure, development options and design changes

was also seen as a key driver of delays. Local community engagement and management is a common area of underinvestment requiring dedicated management and a tailored engagement approach.

3. **Resource constraints:** While resource constraints have eased relative to the 2011-2012 period, megaprojects continue to require significant and specific labor, equipment, services and infrastructure resources for which supply constraints are common. Where multiple projects are being delivered simultaneously in a single region, the market for high-performing human capital and critical equipment could be rapidly exhausted, leading to inflated resource costs, lower-quality outputs and project delays. In regions where infrastructure investment is slow to catch up with exploration and development, access to resources, such as water, power, rail and roads, is often costlier and time-consuming than initially planned.

4. **Regulatory and policy-related challenges:** Many of the study projects had faced delays associated with regulatory requirement, approvals and policy uncertainty. The importance of a jurisdiction-specific approach, which included developing working relationships and actively managing interactions with all agencies in an approval process flow, was consistently recognized. Health, safety and environmental compliances, and associated industrial relations considerations, are key considerations for which conservative estimates should be applied and dependencies across the delivery schedule recognized.

5. **Unfavorable external environment:** Projects are not delivered in isolation from business strategy and external influences, and this potential for externally-driven change is particularly high in developing economies. Geopolitical and security issues have the potential to dramatically delay or halt delivery momentum, often with significantly heightened overhead costs. At a commercial level, volatile commodity prices can drive portfolio prioritization decisions that reduce or remove capital funding and may necessitate scope, design, budget and schedule re-planning. For example, the impact of the recent iron ore price changes on iron ore projects in Western Australia.

Achieving capital productivity

Addressing the risks

Having explored the close relationship between project delivery performance and capital productivity, it is clear that poor project delivery performance and control, including budget and schedule overruns, significantly impacts the level of capital productivity achieved.

Improving project delivery performance starts with successful planning, followed through with rigorous management during delivery. Investments of time, focus and expert review yield the highest return early in the life cycle when the ability to influence outcomes is greatest. Most of a project's key and defining decisions are made during these initial phases, as the delivery strategy and methodology are established, making this the most critical time to plan, get the foundations right and optimize prior to moving into delivery. These typical influence and risk dynamics across the project life cycle are illustrated in the following diagram. This model highlights that the ability to influence project outcomes and performance is greatest at the outset and tends to diminish as the project progresses, decisions are made, designs are locked in and commitments are entered into.

The reverse relationship is true for risk. At the beginning of a project, the delivery risk profile is malleable and a range of preemptive mitigation options are available — as project activity intensity ramps up during the project life, the volume, complexity and severity of risks increases and practical mitigation options can be limited.

Front-end planning activities

Project management factors: Establish rigorous and risk-based cost and schedule estimates and core project management processes across all disciplines (inlcuding project controls, risk management and quality management) in order to define the way these will be implemented on the project. To this end, laying the right

foundations for EPCM and contracting partnerships is paramount, with many leading organizations establishing centralized global frameworks to achieve long-term supplier relationships, performance commitments and a standardized approach to project delivery. In doing so, they are realizing productivity benefits through leveraging this global "buying power."

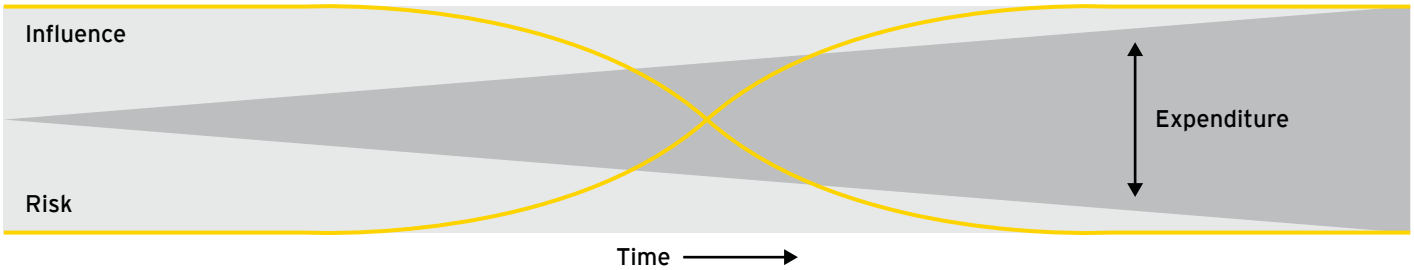
Stakeholder conflicts: Undertake a thorough stakeholder analysis and develop a stakeholder engagement strategy and plan to be used throughout the project in order to proactively manage stakeholders, identify issues early and understand their concerns.

Resource constraints: Undertake risk identification and planning activities early in the project that address this risk. Identify mitigation strategies and alternative options to minimize the impact.

Regulatory and policy-related challenges: Similar to resource constraints, undertake risk identification and planning activities early in the project that address this risk. Further, identify mitigation strategies and alternative options to minimize the impact. Research and leverage lessons learned from past projects to help plan for the current one.

Unfavorable external environment: Undertake the same activities mentioned in resource constraints and for key factors, such as commodity price fluctuations, undertake scenario planning to determine the impact of these factors and how to mitigate them.

Relationship between the project life cycle and the ability to influence the risk profile and expenditure



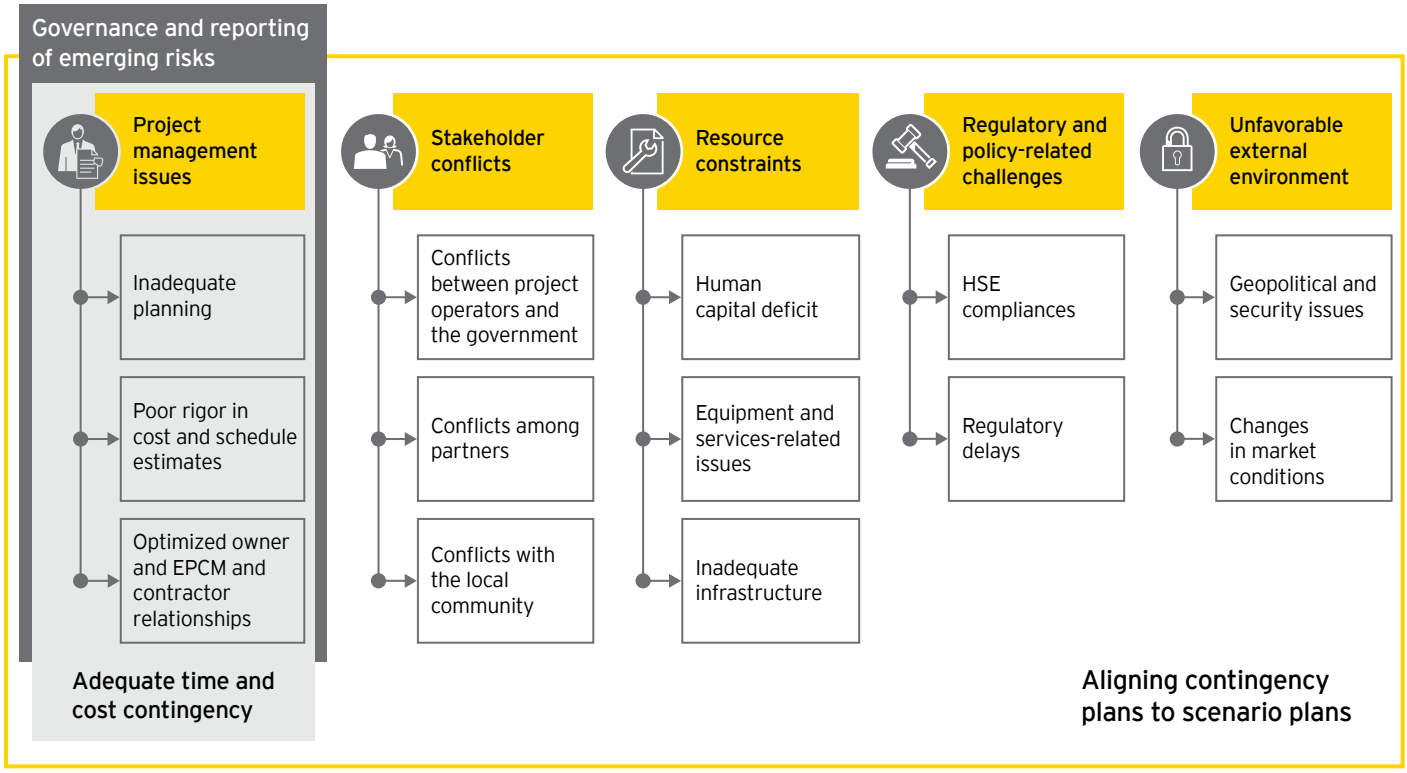
Driving improved predictability and control

Despite many mining and metals sector clients enhancing the process maturity of engineering design, projects continue to experience significant cost and schedule overruns. From our global experience of working with clients on large and complex capital programs, we have observed a consistent theme of underinvestment and lack of focus in three often overlooked but critical areas:

- Implementing governance and reporting frameworks with lead indicators that reliably flag emerging risks while they can still be efficiently mitigated
- Allocating adequate cost and time contingency to account for risks across the life cycle
- Enhancing the value of contingency planning by aligning contingency plans to scenario plans

These areas of underinvestment have strong potential to significantly enhance capital productivity, by addressing a broad range of the key causes that can lead to budget and schedule overruns. They also map activities in the various stages of the capital project and investment planning cycle.

Relationship between key causes and critical areas of underinvestment that can assist to address these



Implementing effective governance and reporting frameworks

Having a well-structured and defined governance framework with clear roles and responsibilities is necessary to ensure that decisions are being made by the right people and in a timely manner. This dynamic is typically well understood on projects; however, what is often absent is having the right information in a usable format to make timely and informed decisions. This information deficit is particularly common in the area of "outer-horizon" key risks – risks that aren't in the "firefighting" stage currently but are material and require timely action. Embedding leading indicators into reporting dashboards is an effective approach to flagging these risks as they begin to emerge during delivery. This makes sure management is empowered with timely information to make quick and effective mitigation decisions, meaning more risks are caught early and addressed before they drive budget and schedule slippage.

Lead versus lag indicators

Lag indicators report on past events, giving performance information. They are useful to understand how a project, for example, has performed against targets and to identify areas that require improvement.

Lead indicators give insight into what may occur. They are used as predictors of an outcome or performance or to indicate something that occurs before or leads to particular events or outcomes.

Leading indicators exist across the range of delivery disciplines. Taking stakeholder management as an example, sample metrics to be considered include the number of stakeholder queries, the number of open queries, time of response and the number of complaints. Where these stakeholder complaints and query metrics indicate stakeholder concerns are not being addressed in a timely manner, they can be powerful lead indicators that signify the potential for more significant issues arising with potential budget and schedule performance impacts. Using lead indicators to monitor delivery performance is a proven technique enabling early awareness and intervention. Similarly, effective lead indicators, which every project should consider monitoring, include contingency drawdown rates (i.e., contingency funding consumption over time) and orphan-risk levels (i.e., no owners or mitigations). Both are effective indicators of risk management and planning alignment maturity. The former enables monitoring of contingency spend, which, when done in parallel to monitoring and analyzing remaining risks, can facilitate an assessment to determine if it is adequate to account for these risks or if a reassessment is required. This facilitates the early identification of a project that may exceed its allocated contingency; thus, mitigations could be developed earlier. For the latter, having an indicator of the number of orphan risks enables the immediate identification of risks that are not being actively managed; thus, it poses a threat they could eventuate and becomes issues that impact schedule or budget. From the indicator, action could be taken to allocate either a responsible person or mitigation measures to ensure these risks do not go unmanaged and potentially adversely impact the project.

Having dashboards that focus on lag indicators provides detail on how a program or project has performed. However, it does not provide insight into what to expect in the future nor enable proactive decision-making and planning that is enabled by leading indicators.

There are typical lead indicators, such as those discussed above, which are useful for most projects. However, an investment in identifying bespoke indicators that are directly relevant to a given project and its success factors is what will drive the most value to ensure delivery teams are getting the right information to steer their projects to success.

To develop a dashboard that incorporates leading indicators requires insight into a project/program's key risks and uncertainties, as well as, an understanding of how it is being managed and implemented and its key activities. This enables the identification of relevant metrics that are predictors of success or precursors to particular risks eventuating.

Key questions

- **Do your dashboards focus on lag or lead indicators?**
- **Are you getting the right information to change direction before risks eventuate or poor performance is reported by a lag indicator?**

Allocating adequate cost and time contingency

Every project and program has a degree of risk and uncertainty. It's for this reason that every project and program needs some form of contingency allocation and a corresponding contingency management process. Effective contingency provision begins with allocating sufficient contingency up-front through a robust process of risk and uncertainty identification and quantification. Leading contingency approaches start from this base and, rather than "set and forget," revalidate contingency alignment at key stage-gating intervals to ensure an appropriate contingency allowance is available for future delivery stages reflecting new information that has come to light. Combined with change control-aligned draw-down processes and contingency depletion monitoring, these contingency control disciplines are the essential building blocks of an integrated contingency management approach.

In formulating initial cost and schedule estimates that would directly inform portfolio prioritization decision-making, the application of defined estimation methods, comparable benchmarks and robust quantitative analysis is crucial. To support executive confidence in business case and baseline integrity, these estimates need to account for not only the base value of works but also an appropriate probability-based provision for possible changes, risks and uncertainty. These provisions are known as contingency and are made in relation to events and forces for which there is a level of likelihood and impact ambiguity. The broad range of events and forces to be considered span both the external environment (such as political, economic, environmental and social considerations) and the internal organizational, portfolio, program or project environment.

Including appropriate levels of contingency in business cases put forward for investment decisions ensures that these decisions are based on the best possible view of likely total capital cost and time. By appropriately considering the probability and impact of risks on delivery, the potential for unforeseen and unmitigated cost and schedule impacts is greatly reduced.

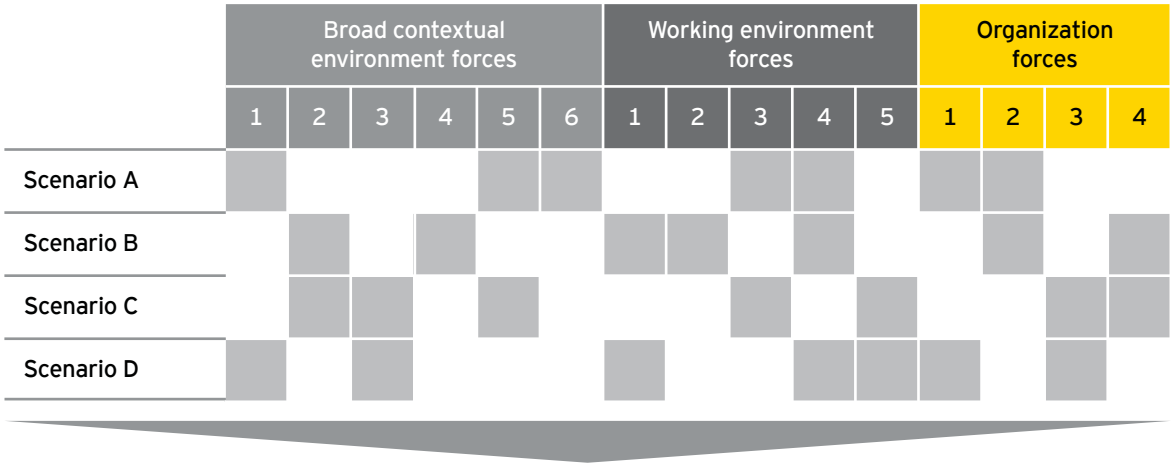
As a project progresses through its delivery life cycle, the risk profile shifts, uncertainties are resolved and risk factors may be realized. With these changes, ongoing management and reevaluation of contingency throughout the life cycle is essential.

Increased certainty comes from the process of discovery, as tasks are commenced and complexities revealed, as well as the progressive development of planning detail from high-level scope through to detailed technical engineering design specifications. As certainty levels change and new information arises, contingency allowances should be revised in line with the project's risk profile. These adjustments will typically enable a reduction in uncommitted contingency as a project progresses, which can be balanced and reallocated across a program or portfolio of parallel investments. It is also possible, however, that unforseen risks cause higher levels of contingency drawdown than initially anticipated; in this scenario, investment committee reassessment may be required to determine if additional contingency will be needed to provide for project commitments through to completion. Projects that fail to accurately estimate and manage contingency, throughout the delivery life cycle, are placed at far greater risk of unplanned budget and schedule variance and corresponding capital productivity decline.

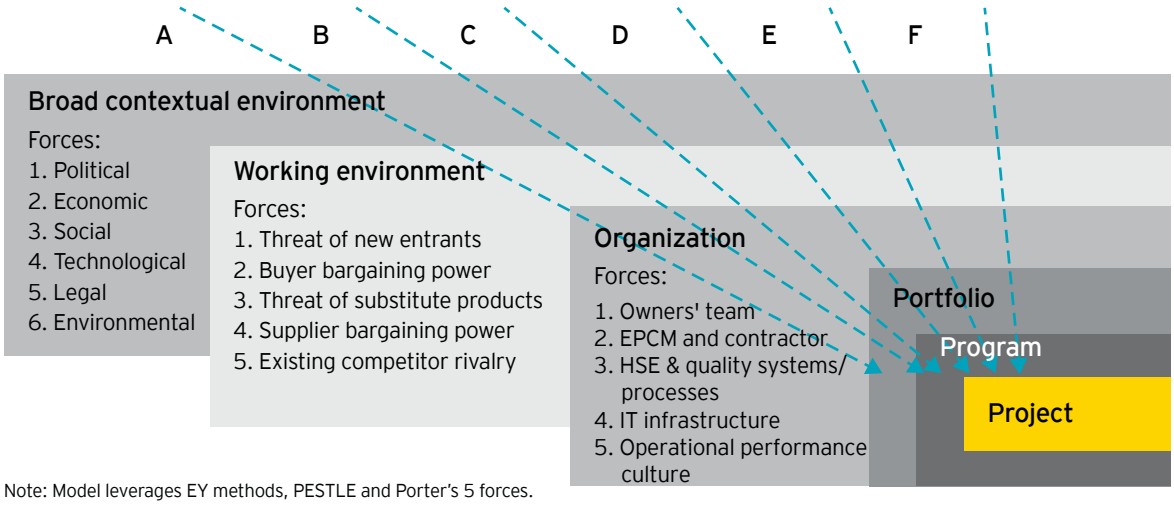
Mature risk management processes will also ensure that the negative impacts on cost and schedule are considered equally with the upside through cost- and time-saving initiatives. Mature processes will also look to engage EPCM and contractors within the process and transfer risk and rewards to those best placed to influence and control risks and opportunities. The most successful of these processes encourage teams to think innovatively and across other sectors in order to protect budgets and schedules, as well as, to drive true productivity across the project life cycle.

Enhancing the value of contingency planning

A missing link in many capital planning processes is the closely integrated connection between the complementary disciplines of contingency allocation and scenario planning. The latter is a methodical approach to exploring possible futures that facilitates the questioning of "what if?" in the context of a particular challenge to be solved, or avoided from the outset. Typically, structured scenario planning is a discipline reserved for corporate strategy future proofing, but these techniques are also ideally suited for application in the context of portfolio, program and project management.



Example scenarios



Note: Model leverages EY methods, PESTLE and Porter's 5 forces.

Scenario planning can be used at all levels to envision possible futures, and these can be used to determine potential financial and schedule impacts by running probabilistic analyses. These can directly inform contingency allocation – an approach that is in contrast to traditional risk and contingency assessment methods, where factors or risks are often individually analyzed without considering the interdependencies between each, and whether they can eventuate concurrently. Scenario planning enables a "sanity check," which is to be applied to consider the possible combinations of factors and the correlations between them.

Once scenarios have been formulated, and contingency allocations made, leading indicators can be defined and monitored to indicate which scenarios are showing early signs of evolving to realization. By understanding the scenarios that could happen, and having an informed view of different scenario impacts, management can be significantly more agile and able to adapt to emerging futures. Given the importance of timely and decisive action to address emerging risks, this increased level of decision-making confidence can make the difference between projects, programs and portfolios achieving capital productivity out-performance, or falling victim to the capital productivity statistics.

Conclusion

While commodity prices are driving belt-tightening and capital scarcity across the mining and metals sector, megaprojects continue to face unacceptable cost and schedule overruns. Long lead times and the need to prepare for the next cyclical upswing will make capital project execution a critical skill of leading mining and metals companies. As our study of global projects reveals, despite increasingly mature delivery skillsets, over two-thirds of projects were facing cost overruns. These overruns were directly impacting the capital productivity and commercial performance of mining and metals companies across the globe, and new perspectives are essential to turn this trend and deliver to boards and investors the predictability and confidence they require.

Considerations when planning (or re-planning) a project

- How are we ensuring that we are aware of future and emerging risks while they can still be efficiently mitigated?
- How are we optimizing EPCM and contractors' relationships and global "buying power" to delivery strategic outcomes and mitigate risks?
- Are we allocating enough cost and time contingency to account for the real risks that could impact our project?
- Could we do more to proactively plan for future scenarios and set contingency so that we can manage them with confidence?

The thirty-one percent of projects delivering in line with their cost, schedule and scope commitment applied some, or all, of these considerations. Can your program of work afford to risk failure by not having these key disciplines front of mind?

How EY can help

Given the current mining and metals landscape, and the challenges and pitfalls inherent in the delivery of megaprojects, companies are struggling to effectively deliver on their agreed-upon plans and strategies. Compounding these delivery challenges, capital projects are now delivered in an environment where stakeholders increasingly demand improved performance, reduced risk and greater transparency over delivery decisions.

Prior to and during investment, stakeholders increasingly ask for independent assessment of key decisions and plans. While often stakeholder driven, the benefits derived from independent assessment and challenge, both in terms of pacifying stakeholder demands for transparency and ensuring unbiased assessment of project business case, delivery plans, budgets and key stage-gate decisions, mean that it is now a valued tool for portfolio managers and board executives who wish to avoid the optimism bias commonly seen on failing projects.

With our closely linked transactions advisory, tax and advisory service teams, and our global team of mobile capital projects industry professionals, EY is able to provide independent, whole-life support and advice to our clients. We bring the skills, qualifications and deep industry experience to advise your project, program and portfolio teams across the capital planning and delivery life cycle from initiation and setup of business cases and commercial delivery structures, through feasibility and into project design, construction, commissioning and handover.

The depth of our commercial knowledge, across the mining sector and project life cycle, means that our capital projects team is ideally positioned to help you manage the risk of your capital projects and portfolio:

- Uniquely acting through direct intervention
- Supporting management teams on specific projects in development, construction or commissioning
- Advising on portfolio risk and performance and stage-gate approval decisions at the board level

We have a history of helping global mining organizations overcome the different capital project issues outlined within this document, gathering and developing leading practices collaboratively with our clients. That means that we are able to play an active and valuable role in almost any team and can quickly source skills and advice as and where our clients' needs arise.

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How EY's Global Mining & Metals Network can help your business

With a volatile outlook for mining and metals, the global mining and metals sector is focused on margin and productivity improvements, while poised for value-based growth opportunities as they arise. The sector also faces the increased challenges of maintaining its social license to operate, balancing its talent requirements, effectively managing its capital projects and engaging with government around revenue expectations.

EY's Global Mining & Metals Network is where people and ideas come together to help mining and metals companies meet the issues of today and anticipate those of tomorrow by developing solutions to meet these challenges. It brings together a worldwide team of professionals to help you succeed – a team with deep technical experience in providing assurance, tax, transactions and advisory services to the mining and metals sector. Ultimately it enables us to help you meet your goals and compete more effectively.

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