



cutting through complexity

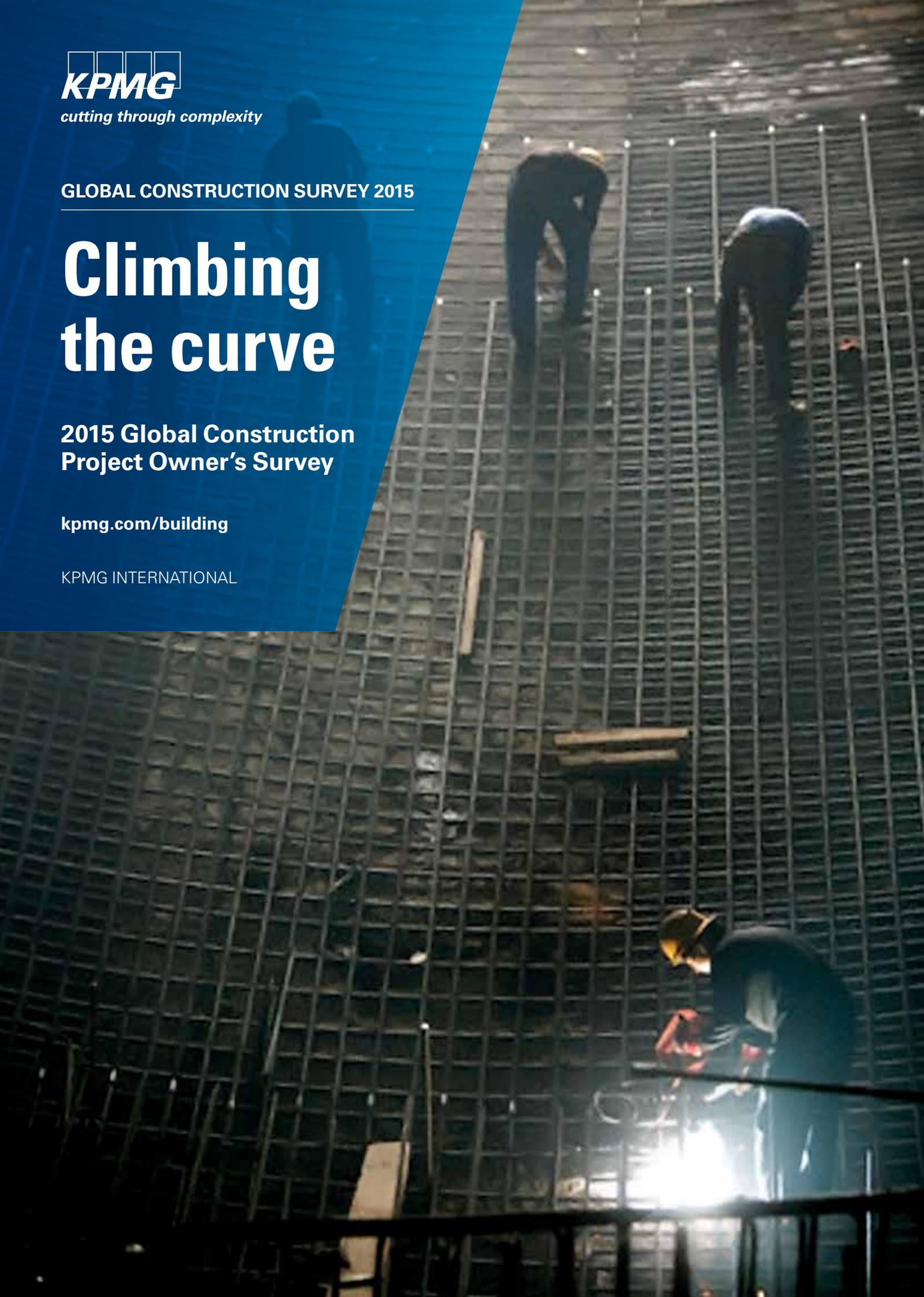
GLOBAL CONSTRUCTION SURVEY 2015

Climbing the curve

2015 Global Construction
Project Owner's Survey

kpmg.com/building

KPMG INTERNATIONAL







Introduction

As construction projects continue to evolve, grow larger and more complex, have organizations gained more confidence in their ability to hit schedule, budget and quality targets?

Project owners are continually striving for a balance between power, responsibility and control. They have the power that comes from control over the budget, yet are ultimately responsible to their corporate Boards and Chief Executive Officers. They bear the responsibility for huge projects worth billions of dollars, along with the associated commercial and reputational costs of failure. Yet, project owners have to cede much of the project execution risk and control to industry experienced engineers and contractors.

Managing these dynamics requires maturity. Maturity in planning and financial forecasting; maturity in hiring and developing the right talent; maturity in ongoing risk and project management; maturity in contingency management to cope with the inevitable setbacks that accompany major construction projects; and maturity to build positive and effective working relationships with contractors that bring out the best in all parties.

In the ninth edition of KPMG's Global Construction Survey we focus on the challenges facing owners as they seek to climb the maturity curve and feature the views of over 100 senior executives from both private and public organizations whose annual capital expenditure ranges from a few million US dollars (US\$) to well over 5 billion US dollars.

The results, augmented with commentary from KPMG's Major Projects Advisory specialists and external industry experts, should enable project owners globally to chart their own levels of project delivery maturity.

I would like to thank all survey participants who gave their valuable time to participate in the report.

Geno Armstrong

International Sector Leader
Engineering & Construction
KPMG in the US

CONTENTS



Executive summary

How are project owners performing on the maturity curve? 02

Maturity in preparation

Setting yourself up for success 04

Maturity in risk, controls and governance

Keeping projects on track 12

Maturity in performance

Project success rates and contingencies 16

Maturity in relationships

The new dynamics of collaboration 20

Conclusion

24

About the survey

26

KPMG's Engineering & Construction expertise

28

Bookshelf

30





» Executive summary

How are project owners performing on the maturity curve?

In late 2014, KPMG interviewed executives from over 100 private and public organizations around the world that carry out significant capital construction activity. The respondents' annual revenue varied in size from US\$250 million to more than US\$5 billion, covering a wide range of sectors including energy and natural resources, technology and healthcare. More than a quarter of the respondents worked for government agencies.

Maturity in preparation

Planning and prioritizing appear to be rigorous

- 30% of respondents say their organization uses the design-bid-build approach and 32% favor engineer-procure-construct (EPC)
- 74% complete a formal project delivery and contract strategy analysis, prior to approval
- 84% utilize financial and risk analysis to screen projects
- 80% say the majority of capital projects are planned

Talent shortages remain a challenge

- 44% struggle to attract qualified craft labor and 45% lack planners and project managers
- Organizations with fewer full-time project staff spend more on capital expenditures per employee
- 69% hire external resources equivalent to more than 5% of the total workforce on a per project basis

Maturity in risk, controls and governance

Owners express confidence in their project controls

- 64% say their management controls are either 'optimized' or 'monitored'
- 55% are 'satisfied' or 'mostly satisfied' with their investment in project management
- 74% feel investment in controls and governance has reduced costs
- 73% are comfortable with the accuracy and timeliness of project level reports

Project management information systems (PMIS) not yet ubiquitous

- 50% use PMIS; of those that don't, 41% plan to introduce this within 2 years
- 32% of those that use PMIS have yet to integrate it with their accounting and procurement software



Maturity in performance

Owners continue to experience project failures

- 53% suffered one or more underperforming projects in the previous year. For energy and natural resources and public sector respondents the figures were 71% and 90% respectively.
- Only 31% of all respondents' projects came within 10% of budget in the past 3 years
- Just 25% of projects came within 10% of their original deadlines in the past 3 years

A mixed approach to contingency planning

- 30% perform quantitative risk analysis to calculate contingencies
- 49% use both a project-level contingency *and* a management reserve
- 30% draw down from a single pool of contingency based upon project risks

Maturity in relationships

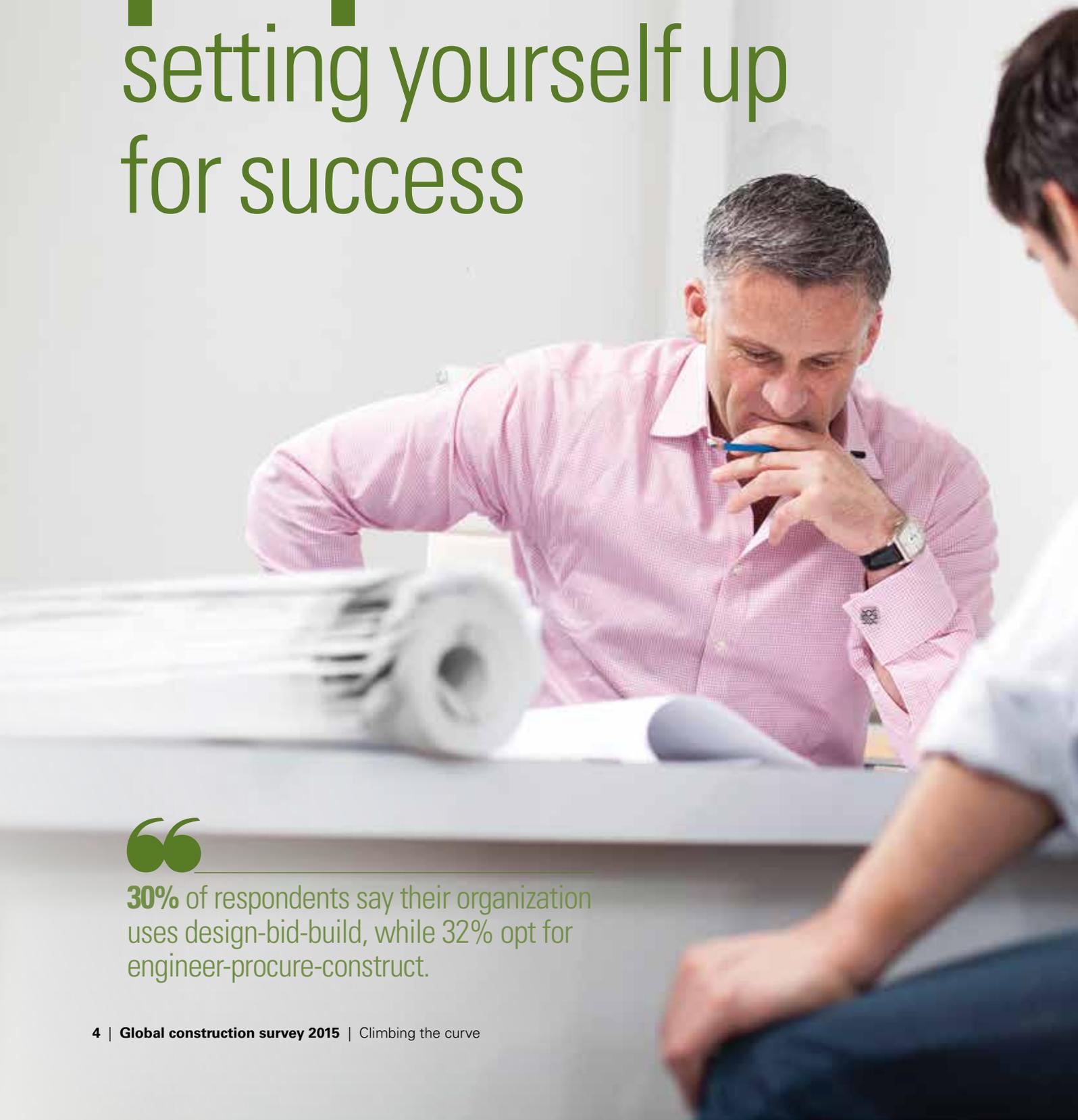
The push towards contractor collaboration may need more impetus

- 82% expect greater owner/contractor collaboration over the next 5 years
- Just 32% have a high level of trust in their contractors
- 69% say poor contractor performance is the single biggest reason for project underperformance

Contracts continue to emphasize the divide between contractors and owners

- 58% are lump sum (fixed price) contracts
- 72% hold full competitive tenders when awarding contracts
- 48% expect to have more negotiating strength vis-à-vis contractors

Maturity in preparation: setting yourself up for success



“

30% of respondents say their organization uses design-bid-build, while 32% opt for engineer-procure-construct.

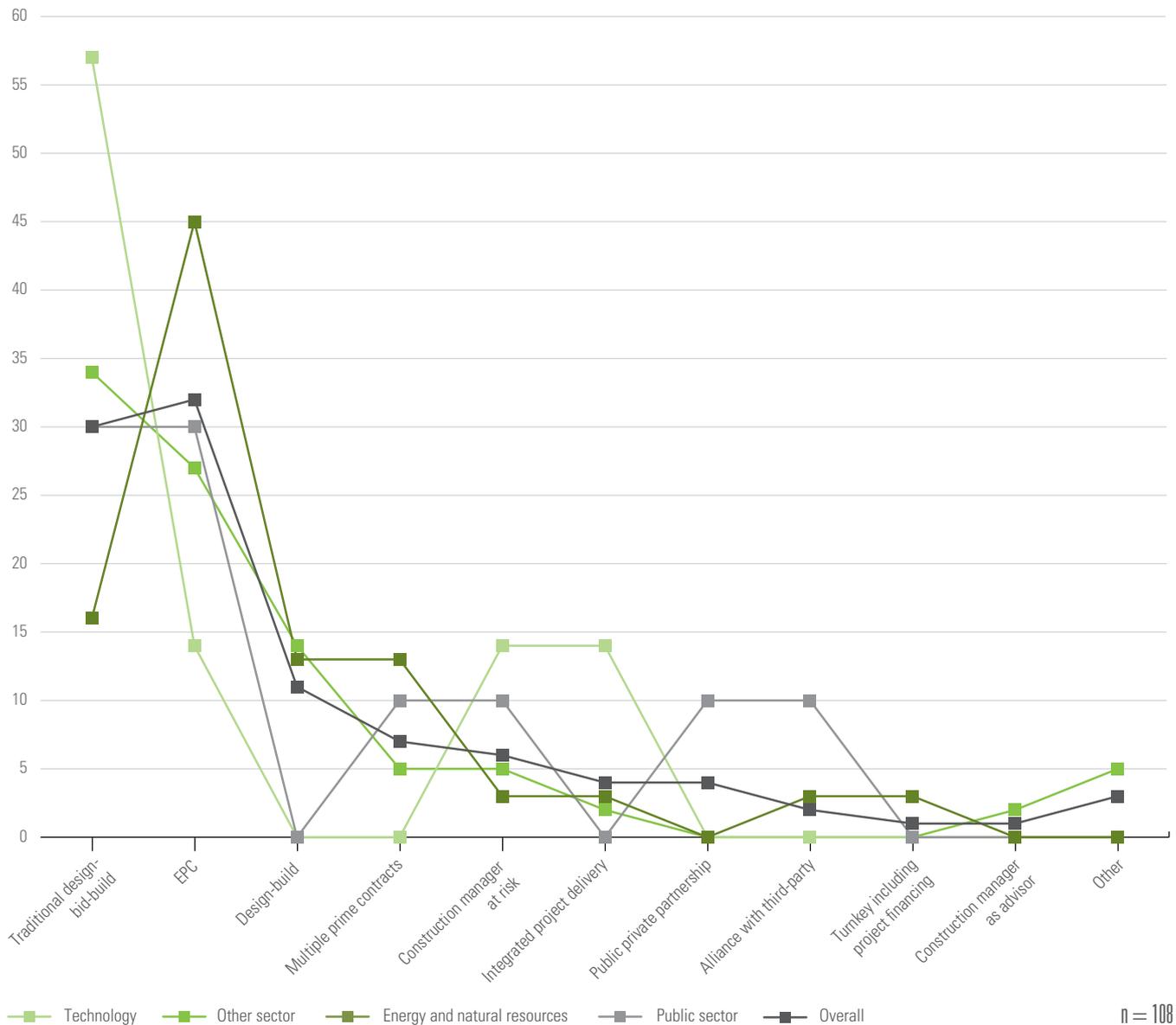
► **Most of the owners in the survey use formal screening, prioritizing and approval processes for projects, including financial and risk analysis**

Despite some concerns about a lack of flexibility, the traditional design-bid-build approach remains one of the two most popular project delivery strategies, enabling the owner to work with various suppliers for different aspects of the project. Sharing the top spot is engineer, procure, construct (EPC), which leaves the contractor in control of design, procurement and construction, giving the owner a single point of contact from start to finish. Both these delivery strategies shift the project risk firmly into the hands of the contractor and suggest either a high level of trust in contractors – or a desire by construction owners to defer the risk and responsibility of project execution to contractors.

► **Almost half of the respondents are concerned about the lack of key skills in-house and augment their teams with external specialists**

Respondents from companies in the energy and natural resources sector are the most likely to favor EPC, while technology businesses, and organizations with a turnover of US\$1 billion to US\$5 billion, are more likely to favor design-build. There is significant evidence of a mature and structured approach to planning, prioritizing and approving projects. Three-quarters of the executives taking part in the survey say that their organization completes a formal project delivery and contract strategy analysis prior to senior management’s authorization of projects. Construction activity is also carefully vetted in advance, with a large majority (84 percent) reporting the use of financial and risk analysis to screen projects.

Most popular project delivery strategy



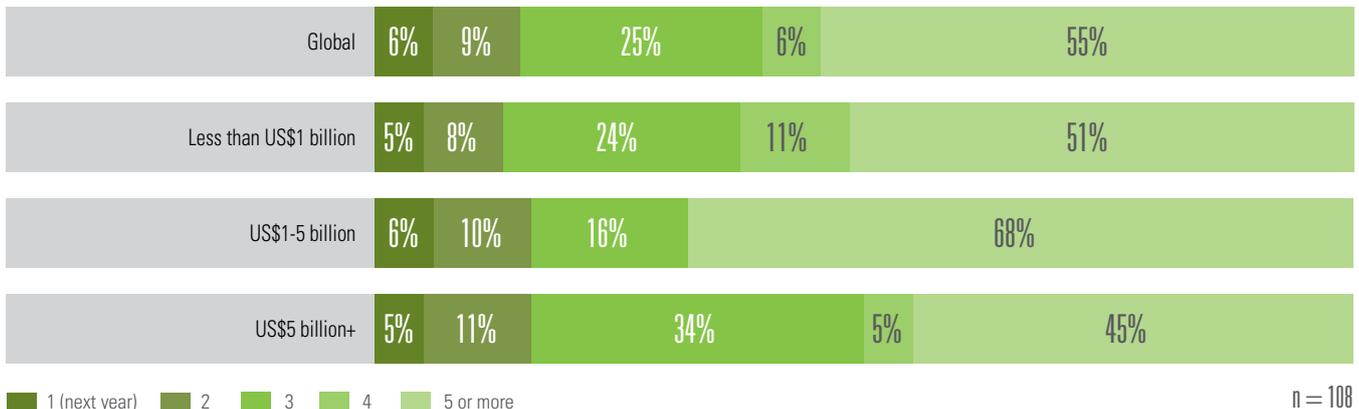


Most owners appear to have a formal ranking process for prioritizing potential projects using pre-established criteria such as operational safety, environmental, legal and regulatory factors, and overall return on investment. A substantial proportion also augments this with more ad hoc analyses.

Much as one would expect, more than 80 percent of owners state that the majority of their capital projects are planned (i.e. are within the annual capital plan), and a similar percentage claims that planned and unplanned initiatives must go through the same rigorous approval process.

Although over half of those taking part in the 2015 survey plan projects at least 5 years ahead, executives from the larger companies are more likely to have a shorter timeframe. Fifty percent of those from organizations with annual turnover greater than US\$5 billion say that they only plan ahead for 3 or fewer years. This could reflect the need to respond quickly to changes in demand, backed by a more sophisticated forecasting capability and an internal project development and management team that can mobilize at short notice.

Number of years into the future organizations plan capital construction projects



n = 108



84% of owners surveyed utilize financial and risk analysis to screen projects.

Prioritizing projects: Optimizing your portfolio



Jeff Shaw

Director, KPMG in South Africa, discusses the processes and considerations needed to help optimize project portfolios.

Whether project owners are operating in buoyant capital project markets or in those still emerging from the economic slowdown there is intense competition internally for funding and people, and externally for scarce contractor resources. Consequently, organizations need to manage their capital efficiently and effectively across a wide range of projects, to ensure they are aligned with strategic goals.

Core capital allocation components include capital budgeting and planning policies and procedures, a cross-functional capital review committee, and a robust system for tracking and reporting across the portfolio. All potential projects should be systematically identified, classified,

screened, prioritized, evaluated and selected. This process must be supported by an appropriate budget allocation and monitoring process. Throughout the capital allocation process, alignment between strategic objectives and the capital project portfolio must be tested.

Of course, this is not the only way to optimize the portfolio; however, this and other approaches should always have established guidelines, to keep projects in line with growth and profitability targets.

With a seemingly endless pool of possible projects, and the need to balance competing interests within ever changing capital and capacity constraints, organizations can struggle to choose the most appropriate mix. Some lack basic guidelines, and may cast the net too wide, which leads to a time-consuming review process that overloads decision-makers with excess information, and causes unwanted internal conflict. Others employ unnecessarily narrow parameters that fail to allow for innovative suggestions that could bring great value.

Once a project is selected, it is easy to neglect the process of evaluating performance against the original business case, to clarify any learnings and document financial

Keeping the talent conveyor belt running

In order to successfully manage the enormous responsibility of a multi-billion dollar project, owners are heavily dependent upon capable project management teams that understand engineering and construction, project management principles and practices and, not least, the increasingly sophisticated technology that controls every step.

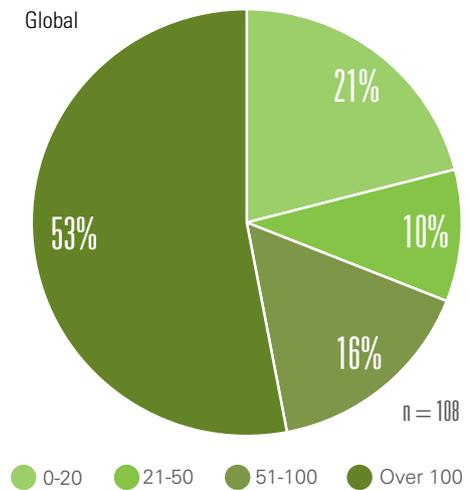
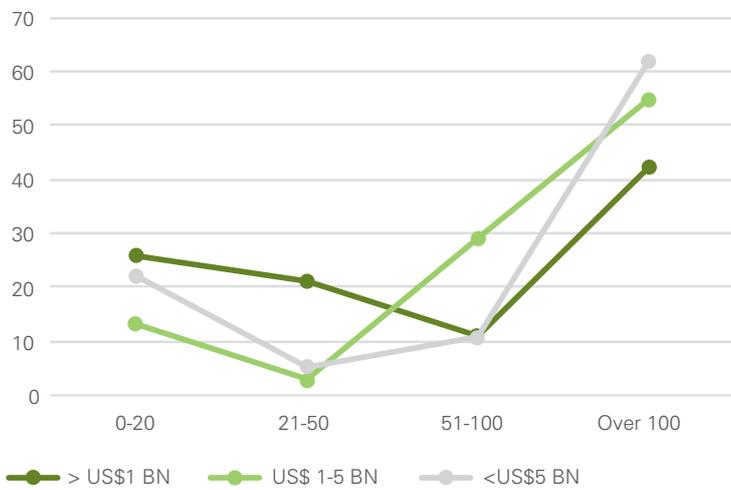
The talent gap is a much-discussed phenomenon in the industry, and owners face the same challenges that contractors have been grappling with for years – to attract, train and retain the best people in the face of severe competition from other sectors. Forty-four percent of respondents say that they struggle to attract qualified craft labor to projects, and a similar percentage claims that a lack

of available planners and project management professionals is hampering their project progress.

One respondent feels that one of the organization's most pressing needs is: "making sure we have well trained project managers with good tools to complete projects on time and within budget."

Not surprisingly, there is a strong correlation between organizational size and number of full-time employees specifically assigned to projects. Almost half of respondents from smaller organizations (less than US\$1 billion turnover) have 50 or fewer staff, while for the largest entities (turnover greater than US\$5 billion), three-quarters have teams of over 50 and 62 percent have more than 100 employees.

Number of full-time employees (FTE) planning and managing capital construction projects



Those organizations with fewer full-time project staff tend to have a higher annual average capital expenditure per employee. Fears that this could stretch their resources are not borne out by the findings, which show that the smaller institutions in the survey also report a lower rate of underperforming projects. This suggests that it is not the quantity of employees that makes the difference, but the quality of employees.

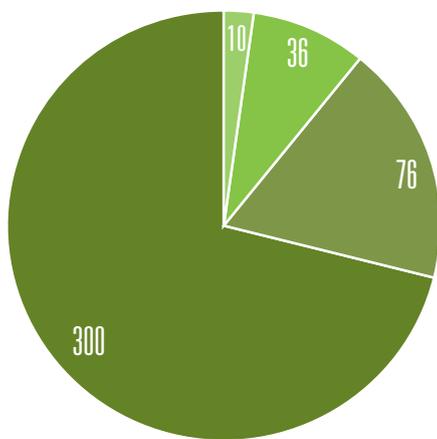
The larger the organization, the more likely it is to have a significant pool of tried and tested project workers. Twenty-nine percent of respondents from larger entities say that they select their teams based upon past performance, compared to just 11 percent for the smaller organizations. Nevertheless, most project workers are chosen on a case-by-case basis.



44% of respondents struggle to attract qualified craft labor and 45% cite a lack of planners and project managers.

Number of FTE planning and managing capital construction projects

Average number of FTE per organization



● Average annual capex per organization (US\$ millions)
 ● Average annual capex per FTE (US\$ millions)

n = 108





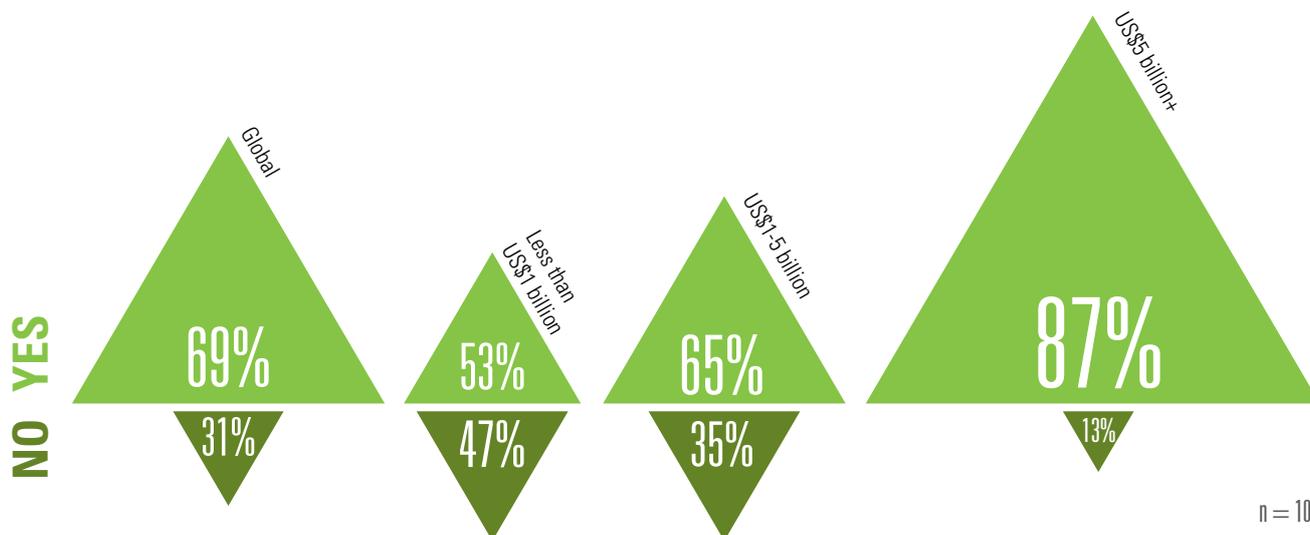
A need for outside assistance

Despite investment in recruitment and training, owners routinely bolster their project teams with additional, temporary personnel, particularly in the aforementioned areas of craft labor and planners and project management specialists. Over two-thirds of the executives in the survey note the need to hire a significant number (more than 5 percent of the total

workforce) of external project or program management experts to supplement existing staff. And, the larger the organization, the greater the need: 87 percent of the larger institutions report the necessity to bring in outside people.

The energy and natural resources sector has been hit hard by the recent plummeting price of oil, and most players, if not all, will have to reduce staff numbers, which can stretch resources when carrying out major construction projects.

Organizations hiring more than 5% of external project or program management personnel to supplement FTE



Source: KPMG International, 2015



87% of the larger organizations in the survey need to augment project teams with external resources.

Thinking differently: a strategic approach to talent management?



Angela Gildea

Principal, KPMG in the US, argues that project owners in traditional sectors should look to new industries for inspiration.

The art of managing mega projects is declining, while the projects themselves are becoming ever more complex. With many organizations outsourcing increasing numbers of tasks to engineering and construction firms, the required skills of internal staff change from 'executing' projects to managing schedules and contractors. And all of this is happening at a time when many traditional owners are seeing graduates enticed by different, often better rewarded positions in new industries. Companies can reap great benefits by taking a fresh approach to talent management.

Be more strategic

Research has found a distinct correlation between strong talent practices and greater shareholder return. For high performing companies, talent management is more than just a Human Resource issue – it's a strategic imperative and should therefore be closely aligned with wider business objectives and accountability shared across all levels of leadership. This means integrating talent considerations into the following areas:

- **business strategy:** to determine the people and processes to help achieve your goals

- **risk management:** ensuring availability of key resources and planning successors
- **investment and measurement:** measuring the return on investment in talent
- **governance and infrastructure:** ensuring clear ownership of talent management, with appropriate data and systems support.

Analytics: using data to drive talent decisions

Although data analytics is a mainstay in business operations, organizations have been slower to embrace this approach for managing talent, where uses include:

- **predictive modeling:** to more accurately forecast future people needs
- **retention algorithms:** to predict which employees are most likely to leave or retire
- **valuing top performers:** calculating the (potentially significant) difference between average and exceptional employees, to justify recruitment strategies and acknowledge individual contributions.

Embrace diversity...of cognitive thought

Most organizations now routinely consider diversity in their hiring practices, but this typically covers gender, race and culture. More enlightened employers are also seeking diversity of a different kind: of cognitive thought, using the following practices:

- **learning and training:** by incorporating courses into formal learning curriculum to build and encourage cognitive diversity
- **hiring the unconventional candidate:** looking beyond the traditional resumé for different skill sets. For instance, data scientists and mathematicians are being hired for



**Maturity in risk,
controls and
governance:
keeping projects
on track**



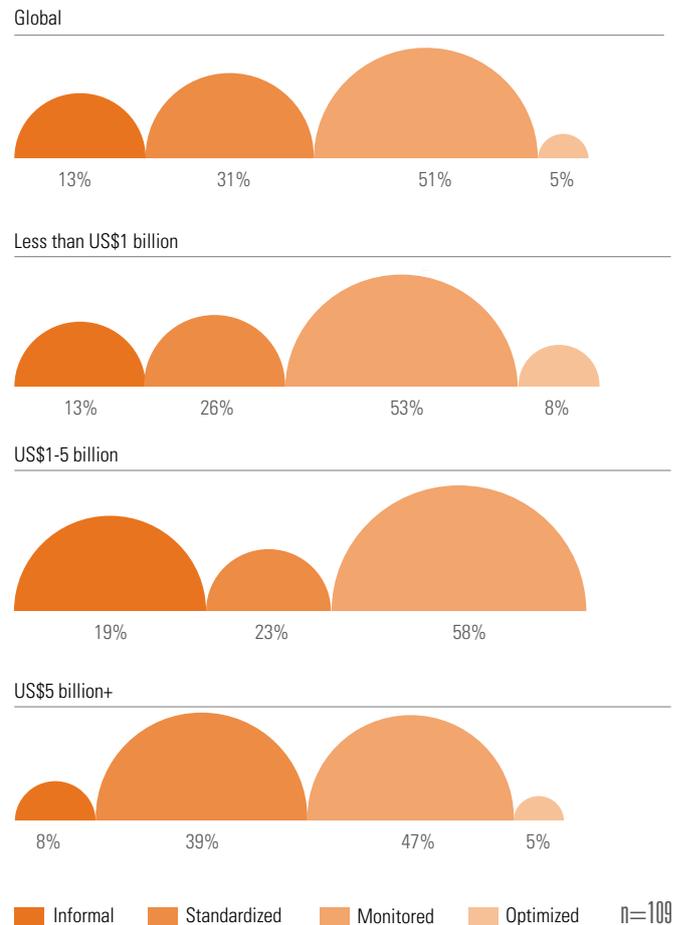
64% of respondents believe that their management controls are either 'optimized' or 'monitored.'

- ▶ Owners appear confident that their investments in project controls have paid off
- ▶ Half of the respondents say their organization has yet to introduce an integrated project management information system (PMIS)

A strong sense of optimism pervades the responses to this year's survey. Sixty-four percent believe that their management controls are either 'optimized' or 'monitored,' meaning that they are documented and integrated, with either real-time or periodic testing and reporting, and frequent or occasional training.

However, almost a third of respondents feel their controls are merely 'standardized,' with no testing or reporting to management and only limited training of staff. These organizations may need to consider how they can upgrade this approach to introduce a best practice. The technology companies taking part in the survey are

Level of sophistication of project management controls



the least likely to have optimized or monitored controls.

Over the past decade, owners have paid considerable attention to introducing cutting-edge software to improve their project controls. This appears to have brought positive results. When asked about the return on investment in project management tools and training, 55 percent indicate that they are either 'satisfied' or 'mostly satisfied,' while just a handful (13 percent) say they are not satisfied. It is a similar story when it comes to assessing the benefits of investment in risk management tools and project cost reduction.

The respondents also believe that the money spent on project governance and controls has paid off. Over three-quarters say that they have 'definitely,' 'mostly' or 'somewhat' reduced costs. However, a significant minority of executives (30 percent) from

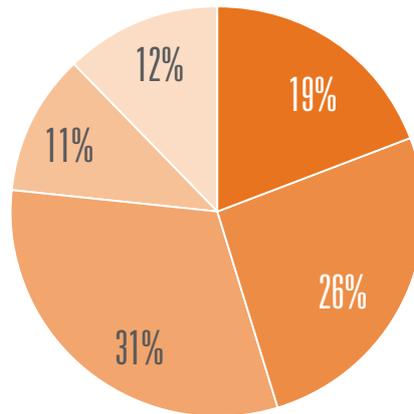
larger organizations in the survey believe that these investments have either not resulted in lower costs, or are unsure of their benefits. It is possible that the scale and complexity of the organization, along with disparate systems, have restricted the impact of new software, which may not be fully integrated.

The optimism continues when the subject of reporting is raised. A large majority of 73 percent are confident about the accuracy and timeliness of the project level reports they get from their project managers and contractors. Once again, however, respondents from the bigger companies or institutions are slightly more cautious, with a third not convinced of the quality of reports, which could reflect the dearth of skilled personnel among their substantial project management workforces.

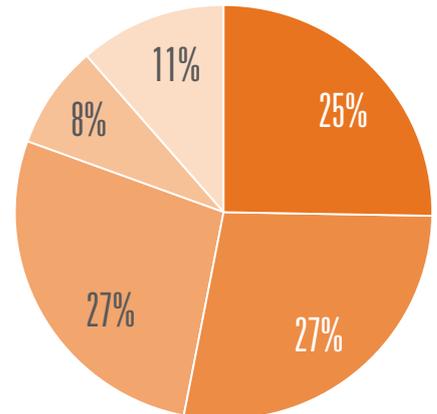
Have investments in project governance and controls reduced project costs?



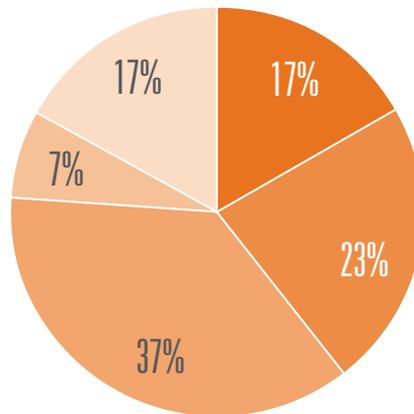
Global



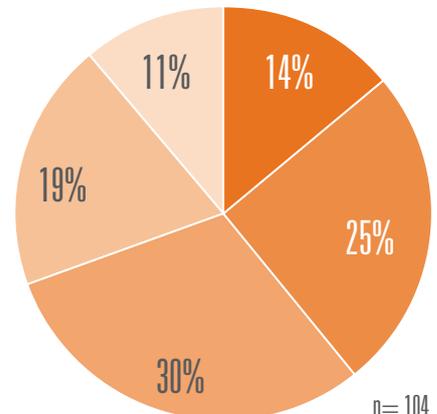
Less than US\$1 billion



US\$1-5 billion



US\$5 billion+



n= 104



Almost half of the larger organizations that use PMIS have yet to integrate it with their accounting and procurement software.

Source: KPMG International, 2015

Project management information system use still not widespread

A PMIS is designed to improve project planning, scheduling, monitoring and controlling, in order to raise the quality of decision-making in each phase of the project life cycle. It enables engineers and project managers to communicate project status swiftly and accurately with functional departments, while also keeping senior management up to speed on all the projects in the organization's portfolio.

The respondents to this year's survey are divided exactly 50:50

in their use of such systems, suggesting there is considerable room for improvement – although 41 percent of those without a PMIS say that they plan to acquire one within 2 years.

Of those who have embraced PMIS, a third have yet to integrate it with their accounting and procurement software, and are consequently failing to realize the full benefits of this technology. This figure leaps to 47 percent among the bigger organizations where, arguably, the potential upside

Is your organization using PMIS to plan and control capital construction projects?



n = 109

The perils of confidence: realities of benchmarking



Clay Gilge

Partner Advisory, KPMG in the US, explains how benchmarking the effectiveness of project management processes can provide a much-needed reality check.

Is the confidence in project controls expressed by the survey participants warranted or misplaced? Our global clients ask the same question continuously, as they strive to avoid the kind of setbacks that can cost millions, damage reputations and hold back business.

In response, we have come up with an ongoing benchmarking analysis that evaluates the maturity of clients' processes and controls over time against peers, as well as internally by region and business unit. Ranking these controls at four levels, from the lowest tier 'informal,' through 'standardized,' 'monitored' and, finally, 'optimized,' we find that organizations are consistently over-optimistic in their self-

ratings, which typically are a whole tier above our rigorous benchmarked findings.

In this year's survey, for example, 51 percent of owners indicated they are 'monitored,' when our data indicates that only 28 percent have reached this level, with a majority still merely 'standardized.' An inappropriate rating could generate a degree of over-confidence that could potentially lead to problems.

Our tried-and-tested approach requires the verification of actual project management process and control maturity, through document review and project testing. This gives the benchmarking far more depth and enables clients – many of whom are Fortune 500 companies or public infrastructure organizations – to develop a road map toward continuous improvement. As you would expect, the cloud-based methodology is grounded in global project management standards and frameworks such as PMBOK and PRINCE2. We also quickly realized that any assessment must include additional criteria such as sustainability, fraud risk management

Tier 1 – Informal

- minimal processes or controls are designed or appear effective
- no apparent project management process/control for monitoring or improvement activity.

Tier 2 – Standardized

- project management process/control design and effectiveness appear to be moderate
- minimal project management process/control monitoring or improvement activity.

Tier 3 – Monitored

- project management process/control design and effectiveness appear adequate
- periodic project management process/control monitoring and improvement.

Tier 4 – Optimized

- comprehensive project management process/control design that appears to be effective
- continual project management process/control monitoring and improvement.

Maturity in performance: project success rates and contingencies

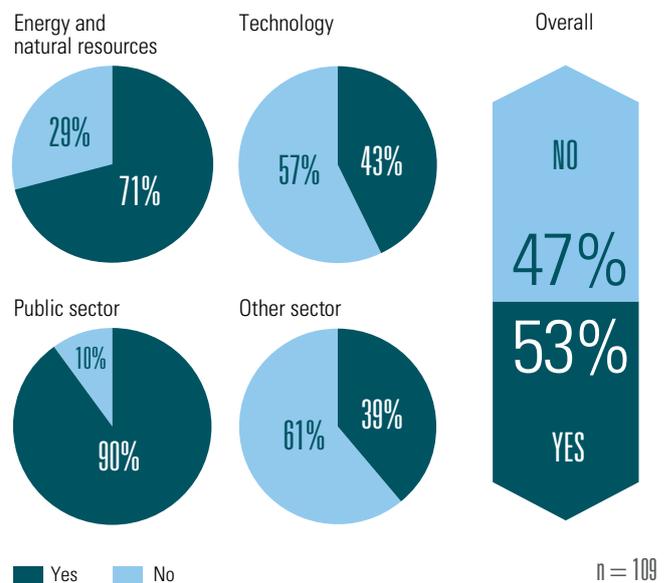


Realism eats optimism for breakfast – owners should demand practical targets from contractors based upon realistic expectations of what can go wrong.

- ▶ Owners are still failing to bring projects in on time and on budget – especially those in the energy and natural resources and public sectors
- ▶ Half of respondents do not use a management reserve, which could lead to an over-optimistic view

The significant investment in project controls – and the high levels of confidence that many owners have in these controls – have not halted the run of underperforming projects. Over half of all the respondents state that they suffered one or more underperforming projects in the previous financial year. For larger organizations, this rose to 61 percent, while executives from the energy and natural resources and public sectors experienced even higher levels of project failure, at 71 percent and 90 percent respectively.

Underperforming projects during the last financial year



Looking back over the past 3 years, fewer than one-third of all respondents' projects managed to come within 10 percent of the planned budget, with the energy and natural resources, and especially the public sector, performing considerably worse than other industries.

Percentage of projects meeting planned budgets

Energy and natural resources



Public sector



Technology

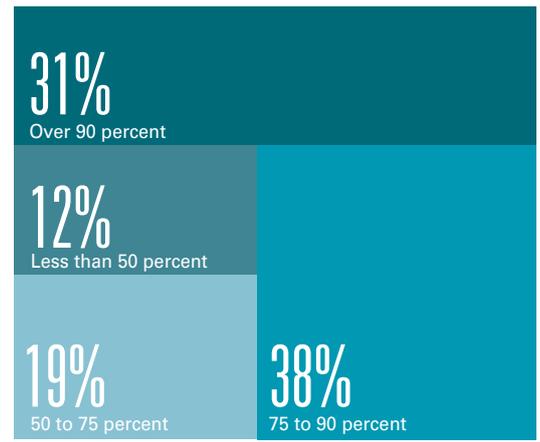


Other sector



90% to 100% 75% to 90% 50% to 75% Less than 50%

Overall



n = 106

Source: KPMG International, 2015

And, in the same time period, just a quarter of construction projects came within 10 percent of their original deadlines; only one in ten public sector organizations managed to hit this target.

One interesting observation is that businesses with turnover between US\$1 billion and US\$5 billion report the best results. Forty-five percent say they met, or were very close to meeting,

their budget, and 34 percent managed to achieve similar high standards for delivery times.

These findings suggest that, while controls may bring many benefits, they have yet to be fully and effectively embedded. The results also raise questions on the skills of those working with

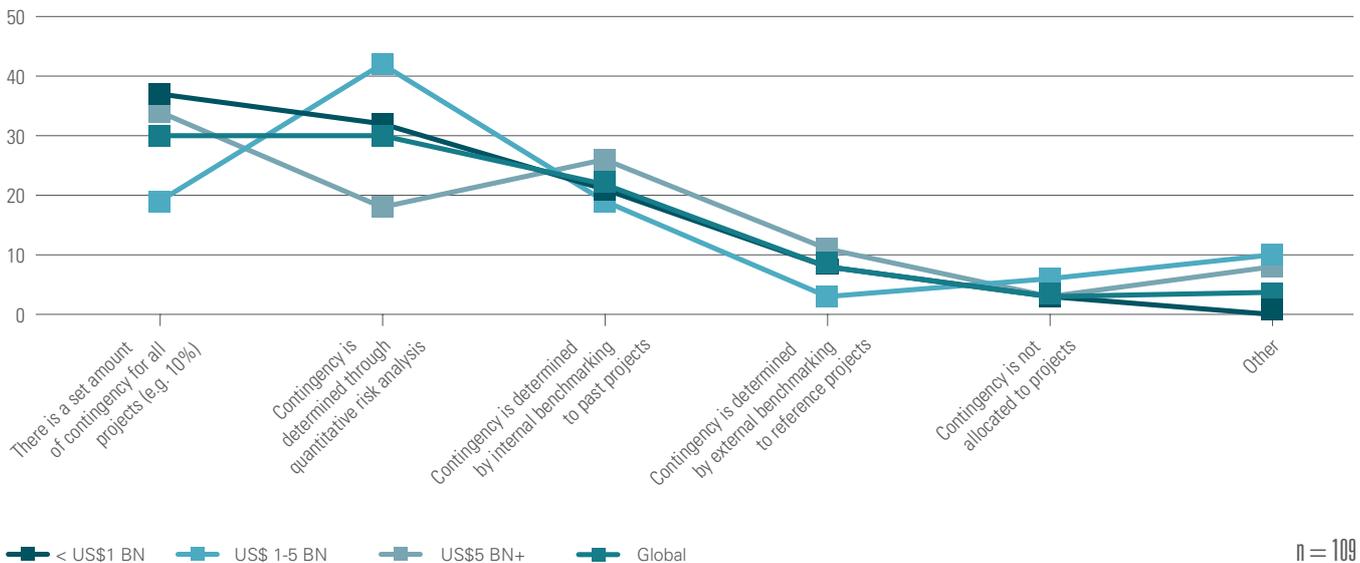
Planning for delays and cost overruns

According to one of the survey participants, one of the biggest concerns is "Accurate estimating of anticipated costs prior to committing to the project. Projects are moving so fast they have limited time to develop the scope and accurately estimate costs. This results in issues where the standard contingency used (10 percent) is not enough to cover the project risks."

Contingency planning typically involves downside risk estimates for budget and delivery times throughout the project life cycle. According to the senior executives participating in

this year's survey, a range of methods is used to calculate contingency levels. The two most popular approaches are: 1) a set percentage, and 2) quantitative risk analysis, with 30 percent respectively opting for these choices. The relative sophistication of the latter suggests that owners are trying to become more accurate in their forecasting, with respondents from companies of US\$1 billion to US\$5 billion turnover more likely to adopt quantitative risk analysis.

Main method for determining project contingency



n = 109

The survey findings indicate that bigger organizations (which tend to have larger and more complex projects) are more likely to take a conservative view of contingency levels. Over half of the respondents from this segment report that the typical range of contingency is greater than 10 percent of the total estimated cost. Arguably, the size and scale of their project portfolios have led to a cautious attitude, tempered by past project cost overruns.

Only half of the respondents state that their organizations use both a project level contingency *and* a management reserve. Management reserves recognize the potential for risks that are outside of the project team’s ability to control, which reflects a more realistic and pragmatic view.

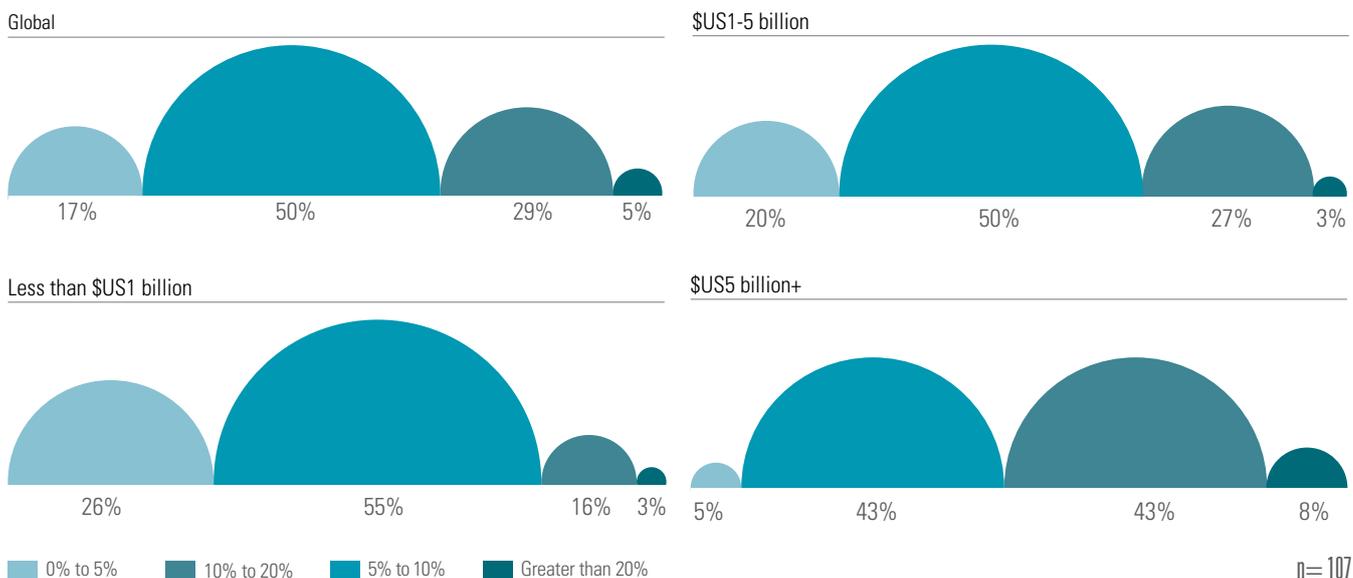
In terms of managing contingencies, the single most common method (used by a third of respondents) is to allocate and, if necessary, reallocate contingency funds directly to

control accounts based on ongoing project risk assessments. While the use of ongoing risk assessments is a leading practice, allocation of contingency directly to control accounts does not give the project manager good visibility into how the contingency is being used.

Thirty percent (and 34 percent of executives from larger organizations) say that they choose to draw down from a single pool of contingency based upon project risks, which shows a more mature and sophisticated approach.

A further 23 percent operate contingency as a single “balancing account” with transfers to and from other control accounts as needed. This only tracks contingency in and out of the project and is not a preferred means of managing contingency in the context of risk.

Range of project contingency (as a percentage of estimated costs)



Less optimism, more logic: the art of scheduling



Gerald Long

Manager Advisory, KPMG in the US, explains some of the lessons he’s learned from over 30 years in construction

Scheduling is one of the most difficult and least understood aspects of a project. As well as helping to plan ahead and model outcomes, it can track progress and provide realistic expectations.

With tens of thousands of activities to manage, too many project teams get bogged down in intense detail at earlier stages, rather than viewing activities at a summary level. And most scheduling is far too optimistic, based upon tight

estimates with little leeway for delays. It’s little surprise that, as this survey shows, only a small proportion of projects meet their delivery and cost goals.

We prefer to apply logic built upon knowledge and experience of what actually happens during the construction life cycle – and what can go wrong. Unfortunately, contractors are nervous about doing this, for fear of scaring the owner, so persist with unachievable targets. Scheduling is not a ‘dark art,’ but it is a complex one, and practitioners must be intimate with the many sequences within a project, and know what questions to ask subject matter experts. They also need to be able to link the cash flow with the work flow, to evaluate the financial impact of any delays.

The biggest project failures are caused by poor scope management and inadequate communication. A good

Maturity in relationships: the new dynamics of collaboration



82% of respondents expect greater owner/contractor collaboration over the next 5 years.

- ▶ Project owners seek closer ties with contractors, but have yet to build truly trusting partnerships
- ▶ Lump sum/fixed price contracts remain the norm

Successful projects are dependent upon strong teamwork, and owners are constantly reviewing the effectiveness of their relationships with contractors. An overwhelming majority of the respondents anticipate more collaboration over the next 5 years. One interpretation of these findings is a desire to integrate contractors into the boardroom to help streamline project delivery, drive down prices and pass on greater risk.

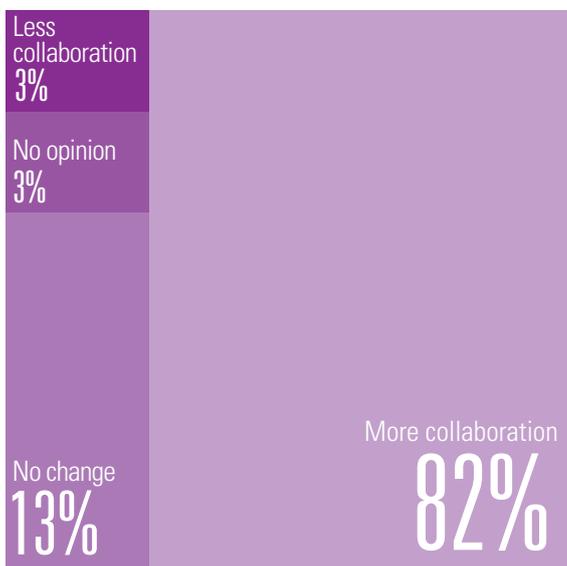
There is, however, another way of looking at the results. Owners may want to stay closer to contractors because they do not *fully* trust them. Only a third believe they have a 'high' level of trust in their contractors, with 60 percent describing the degree of trust as merely 'moderate.'

Indeed, poor contractor performance is cited as the single

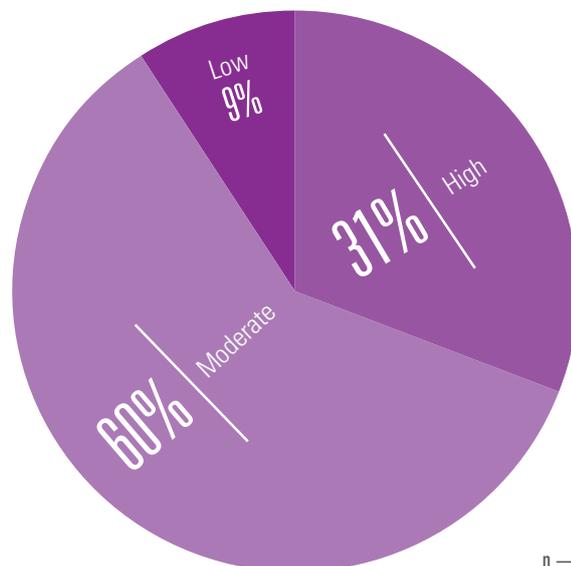


Degree of owner/contractor collaboration over next 5 years

Level of trust between owner and EPC contractors



n = 109



n = 89

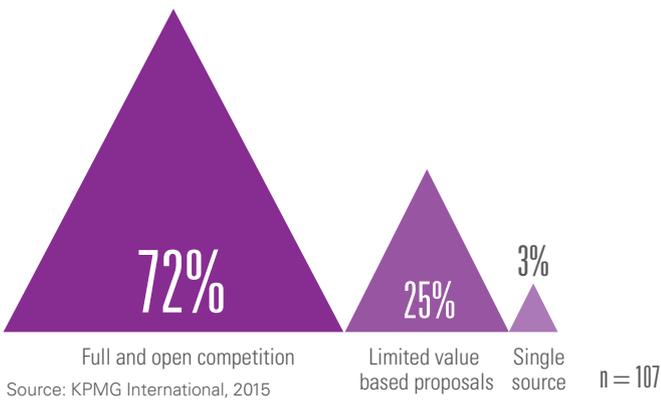
The continued dominance of lump sum (fixed price) contracts underlines the potentially fragile state of owner-contractor relationships. Only the larger organizations involved in the survey embrace other approaches: a quarter use a guaranteed maximum price, while 18 percent adopt a target price with incentives and penalties. A fixed price contract defers risk firmly into the hands of the contractors and does not necessarily foster a collaborative approach.

Seventy-two percent of respondents hold full competitive tenders when awarding contracts, which is another way to maximize risk transfer – and further reflects the lack of trust between owners and contractors. Again, the bigger companies/institutions show a more enlightened attitude, with 34 percent favoring limited value-based proposals, which reward innovation, expertise and quality, and encourage a greater focus on energy efficiency and design excellence.

Most common contracting strategy

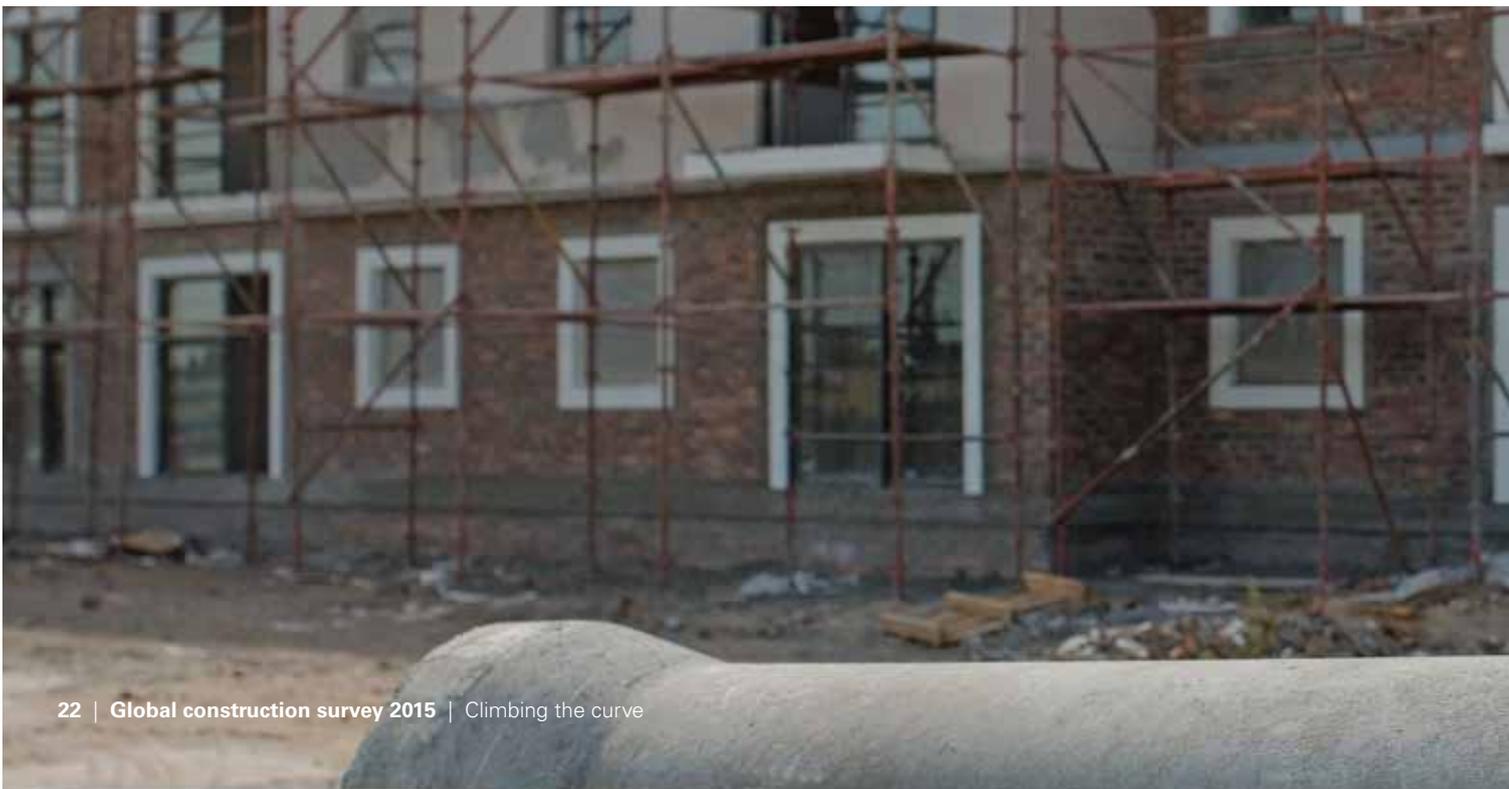


Primary basis for awarding construction contracts



Respondents believe that the balance of power is tilting towards owners. Just under half say that they expect to have more negotiating strength when delivering capital projects over the next 5 years, which again, does not imply a more open, collaborative mindset. Executives from larger organizations are more likely to believe that contractors hold the balance of power, which could make this group willing to create equitable, win-win relationships, rather than try to exploit their bargaining position.

“Only a third of respondents believe they have a high level of trust in their contractors.”



Regaining control of mega projects



According to **T.G. Jayanth**, Vice President Capital Projects, Suncoke Energy Inc., the scale and uncertainty of the very largest construction projects calls for a different approach and more realistic expectations.

Every engineering procurement and construction (EPC) conference I attend is replete with stories of failed mega-projects. As projects have grown larger and more complex, frequently exceeding several billion dollars in value, the capability to execute them effectively has not kept pace.

One response by owner organizations has been an attempt to “contract your way to project success” by passing risk and therefore liability onto contractors. As evidence of this trend, there are several conferences dedicated exclusively to EPC contract management, focused on various risk-sharing strategies.

I don't believe that risk-sharing, at least the way it is currently practiced, is a viable long-term solution for mega-projects. Although contractors should be held fully accountable for carrying out their scope of work, all the risks external to the execution should be the *owner's* concern. Transferring these risks to contractors will end up either driving up the bid price (as contractors price in the risk), or potentially deterring contractors from bidding at all. In the extreme, it could drive contractors out of the project business altogether, as they struggle to fully understand and manage risks they are not equipped to deal with. The net result is that owners will end up paying to cover those risks in any case.

Owners may be better advised to fully factor in all risks during the project development phase, and use the

increasingly sophisticated risk management tools that are now available, to give their management a realistic picture of the probability of different outcomes. And, with risks identified upfront, project teams have time to seek ways to mitigate them – sometimes with little or no cost impact. Projects should not be approved without a full understanding of the range – and statistical probability – of possible outcomes associated with projects spanning several years.

Contract management is important, but good, solid project management and fundamental engineering are arguably even more critical to project success. There is simply no substitute for the meticulous technical and business analysis that's the purpose of the development phase of a project. When this phase needs to be accelerated for business reasons, it is essential to take into account the higher associated risks when estimating return on investment, and ultimately when approving the project.

This is especially significant for the increasingly common, multi-billion dollar mega-projects, encompassing global supply chains and spanning multiple geographies. These may take as long as 5 years to complete, during which time steel and energy prices can swing enormously, essential project team members come and go, and stock markets pass through entire cycles, all of which can impact project costs and final product demand. Many of these variations are hard to predict, let alone model even with the best software. In the midst of such uncertainty, it is practically impossible to produce a static forecast of budgets and schedules.

Despite the cautionary note of this commentary, I think the outlook for projects is bright. The good news is that good project management, risk management and engineering practices are receiving growing attention from both owner and contractor companies. This focus on



Conclusion: five steps to greater maturity





KPMG's 2015 Global Construction Project Owner's Survey reflects the excellent progress made by owners in planning, risk management and execution in recent years. It also highlights a few areas where owners are still striving to improve. As they climb the project management maturity curve, both private and public organizations should consider the following issues:

1

A fresh approach to talent management

An effective recruitment, development and retention strategy should encompass data analytics to help predict future talent needs. And, by widening the net of potential candidates, organizations can attract candidates with new ways of thinking who can augment the existing pool of engineers. Beyond the broadening skills set, there is ultimately no substitute for experience, and owners must find ways to tap into the skill base of older or retiring employees.

2

Integrated project management information systems

The scale and complexity of many of today's construction projects call for swift coordination and real-time reporting. A fully integrated PMIS can keep key stakeholders informed of schedule and cost status, and help enable faster decision-making to keep projects on track.

3

Realism eats optimism for breakfast

Owners should demand practical targets from contractors based upon realistic expectations of what can go wrong. Scheduling needs to balance sufficient slack with targets that stretch – but don't overwhelm. If necessary, owners may seek external scheduling expertise to ensure that they understand the workflow and the full financial impact of delays.

4

Sophistication in contingency

Contingencies should encourage prudent cost management and not be an excuse for overspending. The use of a management reserve acknowledges the potential for uncontrollable risks, while a draw-down approach enables project managers to react quickly and flexibly to situations, while keeping strong control over expenditures.

5

Building an extended team

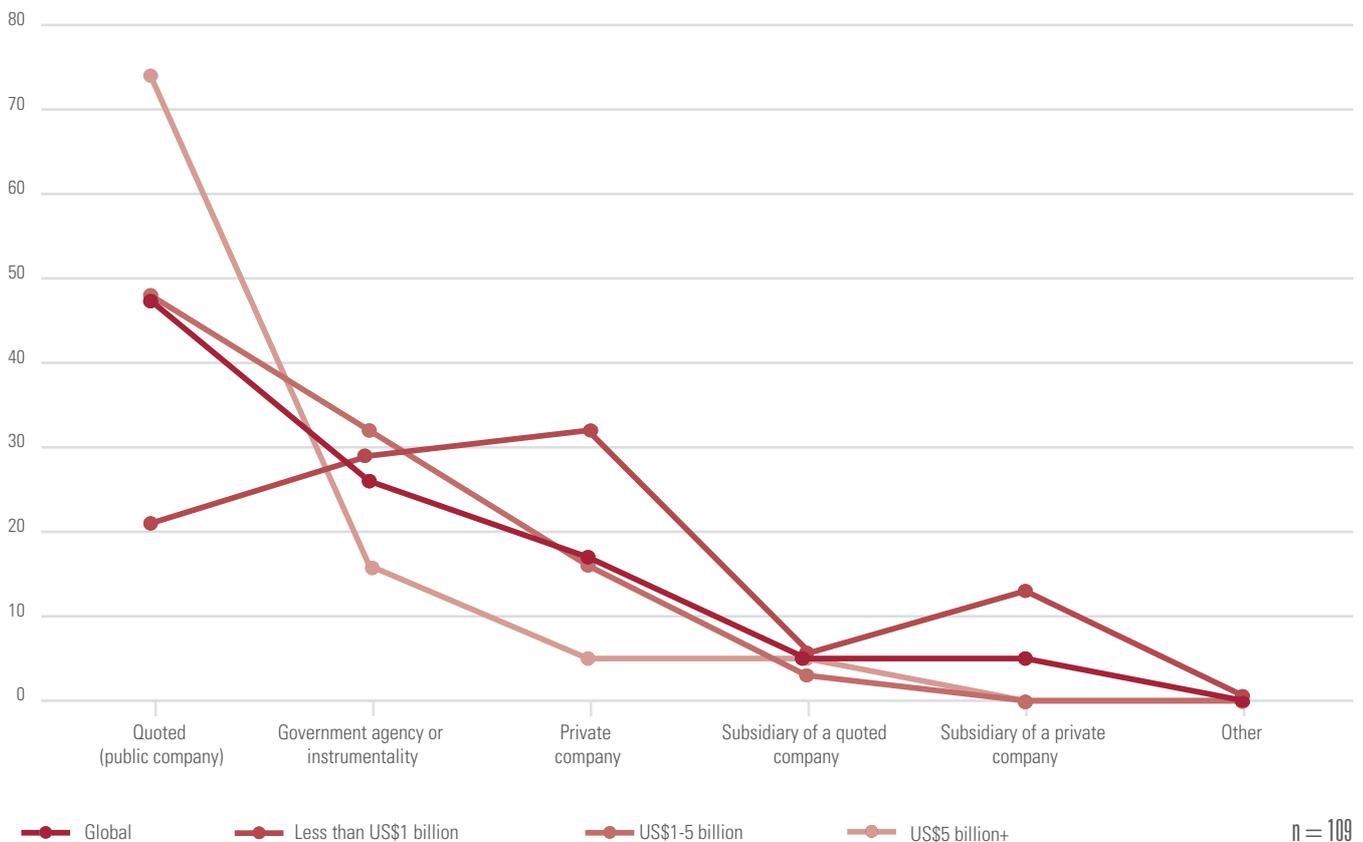
Project owners must invest in relationships with contractors to raise mutual trust and discuss problems or shortcomings. Rather than simply passing all or most of the risk to the contractor, it is preferable to create an integrated project team with common goals and rewards. Where contractors are felt to be lacking in certain skills, owners can discuss how to enhance the team with external expertise.

About the survey

All survey responses were gathered through face-to-face interviews in late 2014 with 109 senior leaders – many of them Chief Executive Officers – from organizations carrying out significant capital construction projects. The interviews were carried out by senior representatives specializing in the engineering and construction industry from KPMG member firms, with the questions reflecting current and ongoing concerns expressed by clients of KPMG member firms.

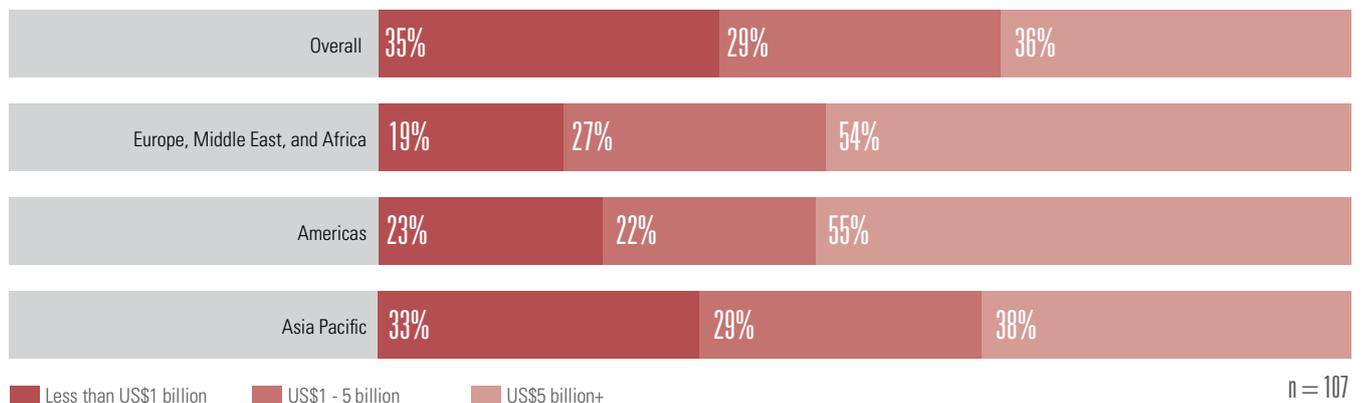
Respondent organizations' turnover/income ranged from less than US\$250 million to more than US\$5 billion, with a mix of operations from global through regional to purely domestic. The annual capital expenditure budget varied from around US\$10 million to over US\$5 billion. Twenty-six percent of the respondents' were public bodies – typically government agencies – and some of the main industries represented include energy and natural resources, technology and healthcare.

Entity type



n = 109

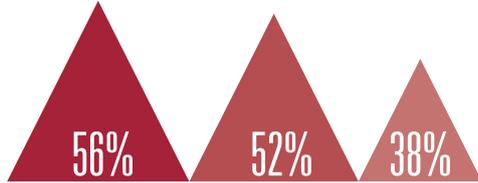
Annual turnover



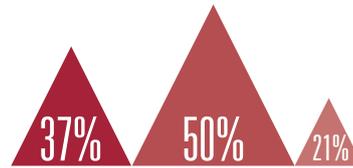
n = 107

Regions of operation

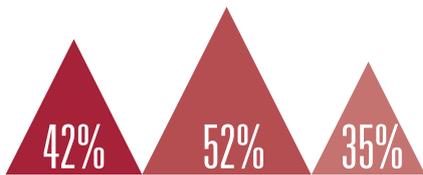
Global



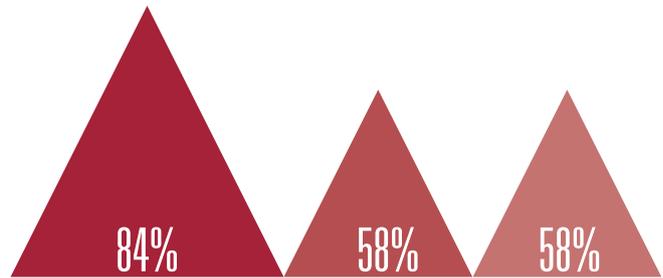
Less than US\$1 billion



US\$1-5 billion



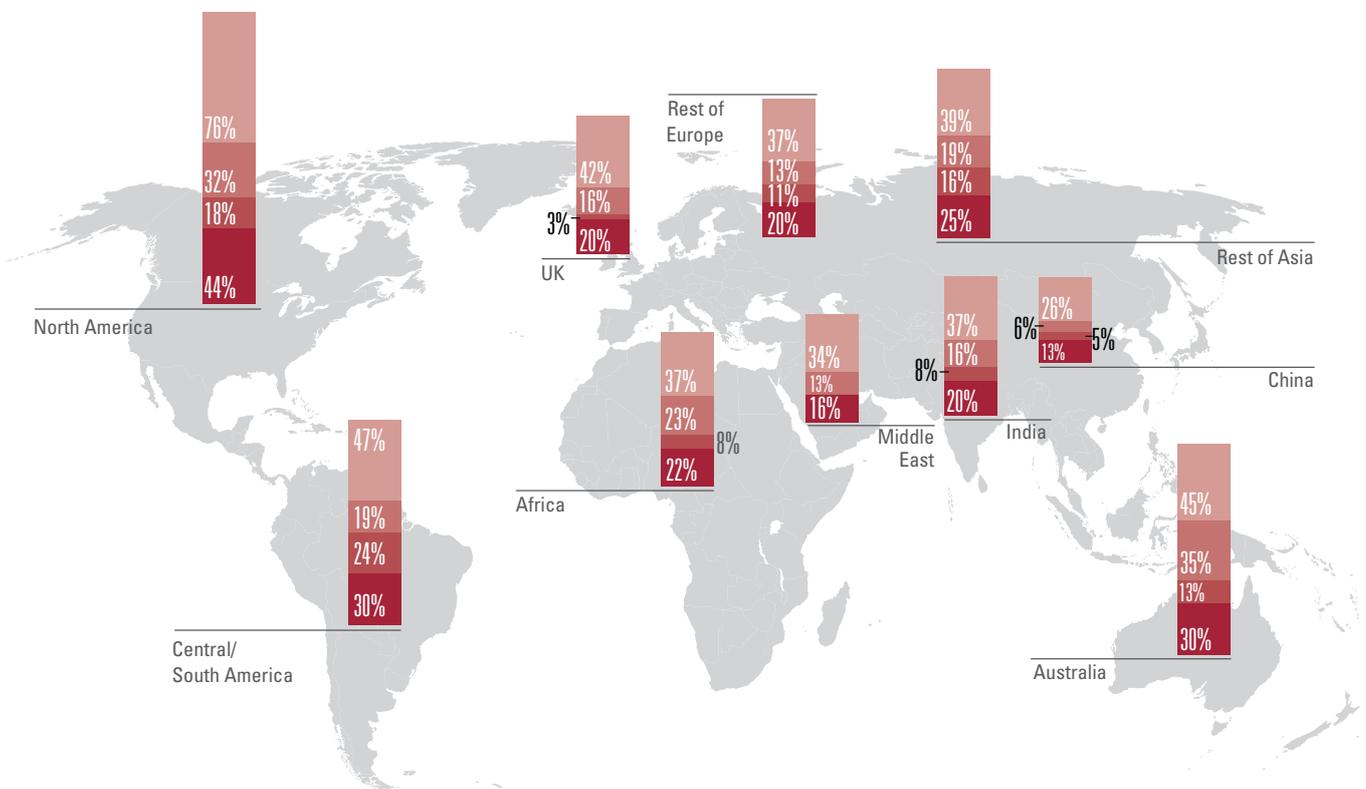
US\$5 billion+



■ Americas ■ Asia Pacific ■ Europe, Middle East, and Africa

n = 109

Sub-regions of operation



■ Global ■ Less than US\$1 billion ■ US\$1 - 5 billion ■ US\$5 billion+

n = 109

Source: KPMG International, 2015





KPMG's global Engineering & Construction experience

Our Building and Construction team is fully committed to serving our clients and understanding their complex and constantly evolving needs.

Our global network enables us to mobilize teams to assist you wherever you are in the world, providing you with access to local and international experience and a tailored service that delivers informed perspectives and clear strategies that our clients and stakeholders value.

Our firms' experienced professionals in audit, tax and advisory bring together a wide range of skills and experience having advised businesses across the globe including developers, contractors, operators, investors, occupiers as well as central, regional and local government organizations on all aspects of the B&C industries.

We can help member firm clients focus on:

Increasing efficiency, through cost optimization, supply chain efficiency and other techniques.

Identifying competitive advantage, by clarifying strengths and weaknesses in your capabilities and producing programs to fill the gaps.

Improve risk management, by refining controls and fostering a culture that embraces and recognizes risk.

Bookshelf

A selection of relevant KPMG reports and insights. To access these publications, please visit: www.kpmg.com/building or email us at: gofmbuilding@kpmg.com

Global Construction Surveys

KPMG conducts the Global Construction Survey to monitor Engineering & Construction issues and provide timely summaries and insights to help professionals make more informed business decisions in today's rapidly changing environment – this is the eighth edition of the KPMG Global Construction Survey.



2013 Global Construction Survey: Ready for the next big wave?

The 2013 report catches the industry in a more upbeat mood after gauging the views of 165 senior executives of leading Engineering & Construction firms from around the world to determine industry trends and opportunities for growth.



2012 KPMG Global Construction Survey: The great global infrastructure opportunity

The 2012 survey focuses on the insatiable demand for energy and infrastructure in all forms, and the resulting fundamental shifts in focus for nearly all E&C firms.



2010 KPMG Global Construction Survey: Adapting to an uncertain environment

The latest survey highlights the cautiously optimistic outlook of many E&C companies about their immediate prospects and discusses key industry issues and the measures adopted to seize the new opportunities identified.



2009 KPMG Global Construction Survey: Navigating the Storm: Charting a Path to Recovery?

More than 100 senior executives from the Engineering & Construction industry responded to this survey, which focused on how organizations were weathering the impact of the global financial crisis.

Other Thought Leadership

KPMG's Engineering and Construction, Major Projects Advisory, and Infrastructure professionals conduct research and develop thought leadership for clients and industry leaders. This information on current issues facing contractors and owners in a rapidly changing construction environment provides key insights and tangibly contributes to their decision-making processes.



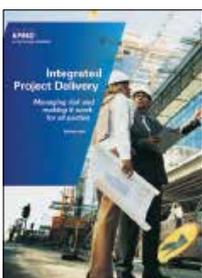
Preventing black swans: Avoiding major project failure

This paper highlights characteristics of major capital projects that can lead to catastrophic failure for owners and contractors, alternative approaches for screening projects, and red flags and triggers for early identification of troubled projects.



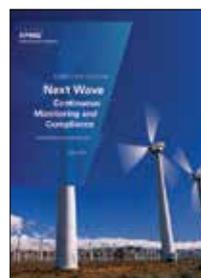
How to successfully manage your mega-project

Effective management of mega-projects relies on three key concepts: early planning and organizing, stakeholder communication and project controls integration, and continuous improvement. This three part series covers best practice for managing mega-projects.



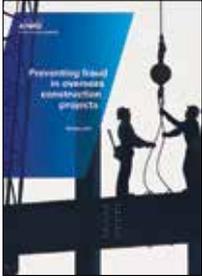
Integrated project delivery: Managing risk and making it work for all parties

This paper provides an overview of the current practices and challenges involving IPD and its evolving risk profile. It also offers guidance on how to prepare an IPD strategy and describes the tools and methodologies currently used to facilitate successful IPD.



Next wave: Continuous monitoring and compliance

This report reviews the framework for developing a continuous project monitoring and compliance program that integrates the positive features of project performance monitoring, project risk and controls monitoring, and computer aided auditing.



Preventing fraud in overseas construction projects

Over the last decade, construction companies have increasingly recognized the imperative of geographic diversification and international expansion and while there are many benefits to investing in emerging markets, the risk of bribery and corruption may be even greater.



Project portfolio optimization: Do you gamble or take informed risks?

This paper addresses portfolio optimization by highlighting some of the challenges and pitfalls of inefficient capital allocation by providing example approaches and practices for identifying and managing projects throughout the life cycle.



ISO 55001: A new era for asset management

This paper discusses the benefits of an integrated holistic approach to asset management, looks at the requirements of ISO 55001 and explains how companies comply with the standard and improve asset performance.

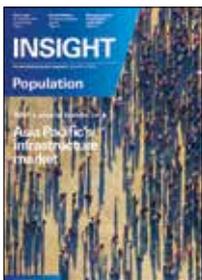


Infrastructure 100: World Markets Report

In the third Infrastructure 100, KPMG highlights key trends driving infrastructure investment around the world and a global panel of independent industry experts identify 100 of the world's most innovative, impactful infrastructure projects.

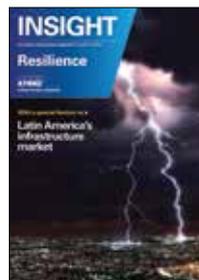
Insight – The Global Infrastructure Magazine

Insight is a semi-annual magazine that provides a broad scope of local, regional and global perspectives on many of the key issues facing today's infrastructure industry.



Issue No. 6 – Population

This edition of Insight takes a closer look at the link between unprecedented population changes and demographic shifts currently underway and the infrastructure needed to meet these challenges. It also includes a Special Report on Asia Pacific's infrastructure market.



Issue No. 5 – Resilience

This edition of Insight explores some of the world's most impactful stories of resilience. It also includes an exciting Spotlight Special Report on the important changes and opportunities within Latin America's infrastructure market.



Issue No. 4 – Megaprojects

This edition of Insight magazine explores some of the key challenges and opportunities impacting megaproject deliver, and includes a Spotlight Special Report on Africa's infrastructure market, a key growth area.



Issue No. 3 – Infrastructure Investment: Bridging the Gap

This edition explores the complex world of infrastructure finance and funding, including critical topics ranging from direct investment, to innovative financing and funding models, and the evolving infrastructure fund market.

MPA Project Leadership Series

KPMG's Major Projects Advisory (MPA) Project Leadership Series is targeted toward owners with major construction programs, but its content is applicable to all entities or stakeholders involved with construction projects. This series describes a framework for managing and controlling large capital projects based on the experience of professionals from KPMG's MPA practice. They provide services to hundreds of leading construction owners, and engineering, procurement and construction contractors.

- From Concept to Project – Critical Considerations for Project Development
- Stakeholder Management and Communication
- Project Organization & Establishing a Program Management Office
- Governance and Project Controls
- Budgeting, Estimating and Contingency Management
- Monitoring Capital Projects and Addressing Signs of Trouble
- Project Risk Management (future)
- Investing in Tools & Infrastructure (future)

Contacts

For further information, please visit us online at kpmg.com/building, email: gofmbuilding@kpmg.com or contact the appropriate geographic lead:

Geno Armstrong
International Sector Lead
Engineering & Construction
KPMG in the US
T: +1 415 963 7301
E: garmstrong@kpmg.com

Cándido Pérez Serrano
Partner in charge Infraestructure,
Transport, Government & Healthcare
KPMG in Spain
T: +34 91 451 30 91
E: candidoperez@kpmg.es

Ramón Poch
Partner, Head of Infraestructure
KPMG in Spain
T: +34 91 456 35 96
E: rpoch@kpmg.es

Fernando Vizoso
Director, Infraestructure &
Transport - Markets
KPMG in Spain
T: +34 91 456 60 34
E: fvizoso@kpmg.es

KPMG's 2015 Global Construction Survey would not have been possible without contributions from Clay Gilge, Brian Relle, Randy Meszaros, Kevin Max, Jeffrey Kagan and Dane Wolfe.

kpmg.com/socialmedia



kpmg.com/app



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2015 KPMG International Cooperative ("KPMG International"), a Swiss entity. Member firms of the KPMG network of independent firms are affiliated with KPMG International. KPMG International provides no client services. No member firm has any authority to obligate or bind KPMG International or any other member firm vis-à-vis third parties, nor does KPMG International have any such authority to obligate or bind any member firm. All rights reserved.

The KPMG name, logo and "cutting through complexity" are registered trademarks or trademarks of KPMG International.

Designed by Evalueserve.

Publication name: Climbing the curve

Publication number: 132253-G

Publication date: March 2015