

IPANewsletter



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Are Mining Companies Ready for the Next Investment Upcycle?

By Astor Luft, Director, North America

A decade of underinvestment in mineral projects and the changes associated with the green economy is setting the mining industry up for a period of growth that may last for decades. How can mining companies prepare for this next investment upcycle?

The Coming Mining Upcycle

Almost a decade of low mineral prices led to the stagnation of mining industry capital spending. However, when COVID-19 pandemic lockdowns started in 2020, we saw a surge in mineral prices driven by anticipated and actual supply shortages. The spike in prices eased as production resumed; however, prices remained higher than in the recent past, supported by government stimulus packages on infrastructure spending as part of economic recovery plans following the pandemic.

During the same period, we saw an increased global focus on decarbonization initiatives, which started driving demand for commodities consumed by electrification and battery technology, including copper, nickel, cobalt, lithium, and rare-earths, among others. This increase, coupled with the mining industry's own decarbonization plans, started to put more pressure on mining company project systems.

According to the International Energy Agency (IEA), green energy technologies require a substantial amount of mined minerals and metals.

IPA Newsletter

Independent Project Analysis, Inc.
Volume 15, Issue 1
March 2023

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IPA improves the competitiveness of our customers through enabling more effective use of capital in their businesses. It is our mission and unique competence to conduct research into the functioning of capital projects and project systems and to apply the results of that research to help our customers create and use capital assets more efficiently.



Independent Project Analysis, Inc. is the preeminent organization for quantitative analysis of capital project effectiveness worldwide. At IPA, we identify Best Practices to drive successful project outcomes.
www.ipaglobal.com

Whether for manufacturing electric vehicles batteries, onshore wind plants, or solar photovoltaic systems, clean energy technologies depend on the minerals sector as a key enabler of the effort to reach net-zero global emissions by 2050, which means that intensive mineral project activity are likely to continue for decades to come.

The Ups and Downs of Mining Investment Cycles

As with most heavy industry sectors, mining capital projects tend to follow investment upcycles and downcycles, usually in line with the growth of commodities prices, which are commonly driven by increased demand, but also related to supply shortages, logistical bottlenecks, and other geopolitical situations.

As shown in **Figure 1**, the most recent minerals upcycle started around 2003, driven by the rapid growth in the industrialization of China and other emerging markets. The upswing in mineral prices led to an increase in mining company investments to expand production capacity and develop new mineral deposits, which typically require very large capital projects. However, once the global demand for materials declined around 2011, a drop in mineral prices led to a downcycle and large mineral projects were rarely authorized.

To provide some context, a new mine expansion project will take about 5 years from opportunity identification to production start and a greenfield mine may take 10 to 20 years from the resource discovery to the delivery of the full production asset. Hence, even with the upcycle end, the mining industry projects portfolio remained active for several years after as the industry completed those large (frequently schedule-driven) projects that were authorized during the upcycle. Further, because the projects were concluded during the down cycle, they were only able to sell their products at lower prices, meaning many of those companies are still working to recover their investments. (See **Figure 2**.)

Are Mining Companies Ready to Meet the Next Upcycle?

The mining industry has been particularly dynamic in the past few years, focusing on mergers and acquisitions, internal restructure and reorganizations, and managing the resources lost during the pandemic. Compared to other industry sectors that IPA works with, mining companies have notably weaker capital projects systems. Most mining companies are low on owner staff and are mostly decentralized, precluding a disciplined approach to capital project planning and governance.

This finding is concerning because strong project systems are particularly important for the mining industry, given that its projects typically have large capital investments, large development footprints, and great effects on local physical and economic environments, which drive high complexity project shaping. The complex shaping aspects frequently relate to permitting, stakeholder management, and infrastructure requirements. Weaker project systems are less able to manage project complexity, often delivering worse project outcomes. As shown in **Figure 3**, IPA research found that mineral projects have larger cost growth

and schedule slip and worse production than other industry sectors.

Considering their weaker capital management systems, the question is: Are the mining companies in a position to manage the large-scale investments needed for asset developments to meet the future demand?

Building a Strong Project System

As the industry sees growth in capital projects on the horizon, mining companies start to worry about the health of their own projects organization and their capability to deliver their much-expanded capital portfolios. In the past few months, IPA has noticed a significant increase in requests for mining company services, related to project risk assessments and project system improvements. These companies are seeking assistance to identify gaps in their project development process and to strengthen their project organizations and governance processes, as they see their portfolios growing to levels that they have not seen in many years.

IPA has been able to assist mining companies in mapping critical risks and developing action plans for their projects and systems. During these engagements, we discovered that several companies are already managing portfolios above and beyond their capabilities, so strengthening their project systems becomes even more important. Building a strong project system is critical to sustain good project performance and a healthy portfolio that brings positive returns to shareholders. It is important to note that, due to the long cycle time of a capital project, it may take years for a new project system to deliver the benefits of an improvement exercise. Reorganizing and restructuring a projects organization requires commitment to improvement from business executives and project system leaders.

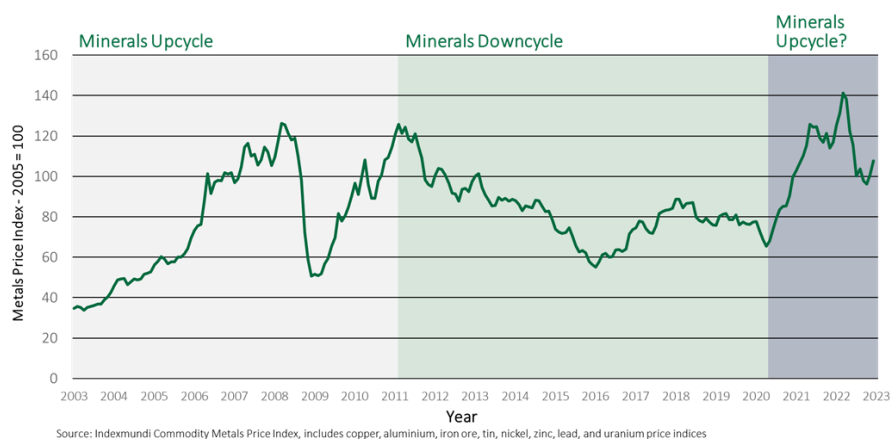


Figure 1

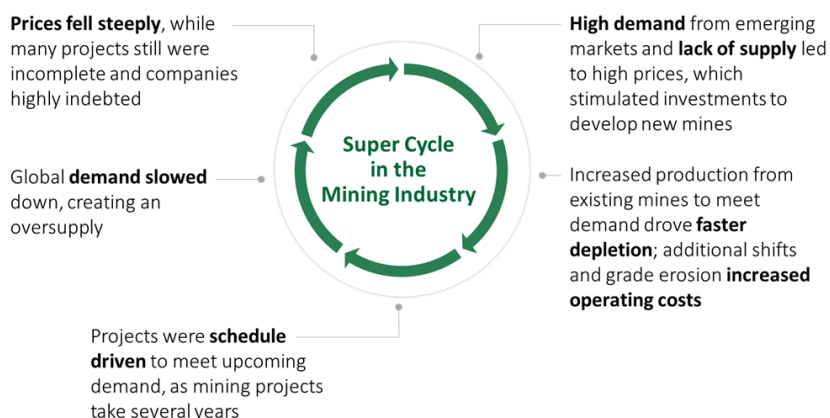


Figure 2

Minerals Project Predictability Is Worse Than Other Industry Sectors

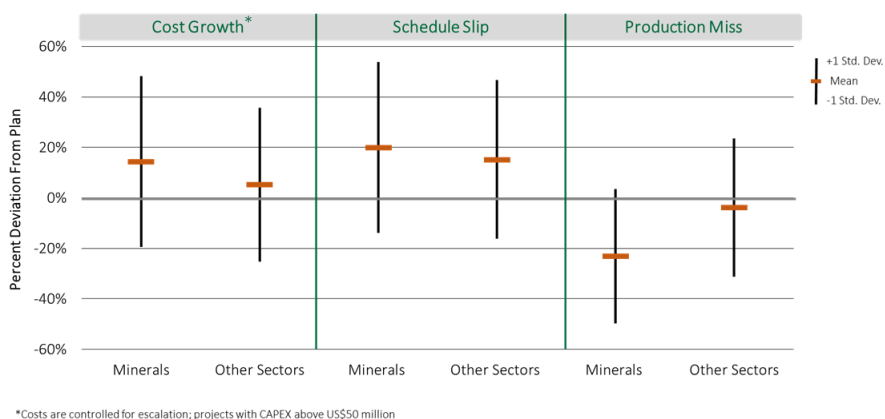


Figure 3

Establishing a strong project system requires development through the following aspects:

- Implementing the appropriate project management process and practices
- Adequately staffing project management and technical functions
- Training project teams on the right way to plan and execute projects
- Educating company executives on how to make the right project decisions

In addition to implementing the above, a strong project system requires the exercise of these practices and refinement and adjustment of the practices to align with the company's culture and portfolio characteristics. Strong project organizations will manage their institutional knowledge in a way that the learnings are documented and shared across their project professionals. A project organization is built on strong processes and personnel. Work processes can be developed quickly, but they take time to implement, test, and adjust to the needs of the organization. Personnel development takes several projects worth of experience. As many mining companies have lost their capabilities over the downcycle period, getting back on track and being ready to deliver these new projects should start now.

How IPA Can Help

IPA has a variety of products and services to help our clients develop robust project systems and projects for consistent capital performance. The products and service that can benefit the mining industry include:

- Individual project evaluations, which provide a comprehensive readiness assessment and risk analysis for projects at different project stages
- Cost and schedule risk analysis to provide early cost and schedule benchmarks and risk assessment for better contingency allocation
- Cost engineering metrics to support cost estimation and validation
- Capital project system assessment, to evaluate the current state of a capital project system and understand the system strengths and weaknesses and take action toward improvement
- Consulting services to diagnose, re-engineer, and deploy an optimized and fit-for-purpose capital project

system, including work process, organization, and governance aspects

- Specialized support on system organization design, system staffing benchmarking, and individual project team staffing study
- Research services to address client queries by conducting special studies based on the IPA database and/or leveraged to IPA's unique access to capital project data

IPA's database covers a wide range of mining and minerals projects from around the globe, with detailed information in terms of project types, scopes, and commodity types, which enables us to develop models to benchmark most scopes of a mining project, including mine development, process facilities, and infrastructures in scope. Hence, IPA is well positioned to support our clients to get ready for the next upcycle.



Cost & Schedule Risk Analysis (CSRA)

Like a crystal ball for capital projects, the CSRA accurately predicts your project's cost and schedule and identifies the potential risks.

Contact Shubham Galav at **sgalav@ipaglobal.com** to find out if your next project will come in on-time and on-budget.

Investment in Construction Union Labor Pays Off for US Capital Projects

Michael McFadden, IPA Deputy Director, Research

Conventional wisdom is that unions benefit workers, but are expensive to companies. However, recent Independent Project Analysis, Inc. (IPA) research has found the opposite: projects that use union labor have better outcomes than those that use non-union or open shop labor, despite union projects having higher hourly labor rates. Projects that used union labor had lower costs overall as well as better cost and schedule predictability. Although many factors go into project success, the difference between union and open shop labor comes down to better productivity for union labor.

Union Labor Projects Have Lower and More Predictable Costs

The recent IPA study confirmed earlier work¹ that found that union labor delivers lower and more predictable project costs. As shown in **Figure 4**, projects that use union labor have 4 percent lower costs than those that use open shop labor and are 10 percent more predictable. Those that use a mix end up somewhere in the middle—better than all open shop, but not as good as all union labor.

Labor Productivity

Figure 5 shows the wide range of labor productivity on process projects in the United States: the middle 50 percent range productivity indices range from 0.5 to 1.5—that is, half the average to one and a half times the

Union Labor vs. Mixed and Open Shop Project Cost Performance



Figure 4

Distribution of Labor Productivity on Process Projects in the United States

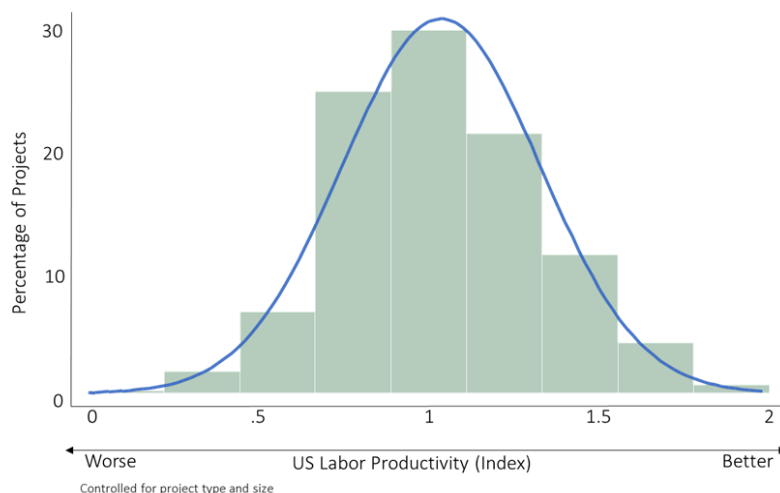


Figure 5

Union Labor vs. Mixed and Open Shop Labor Productivity

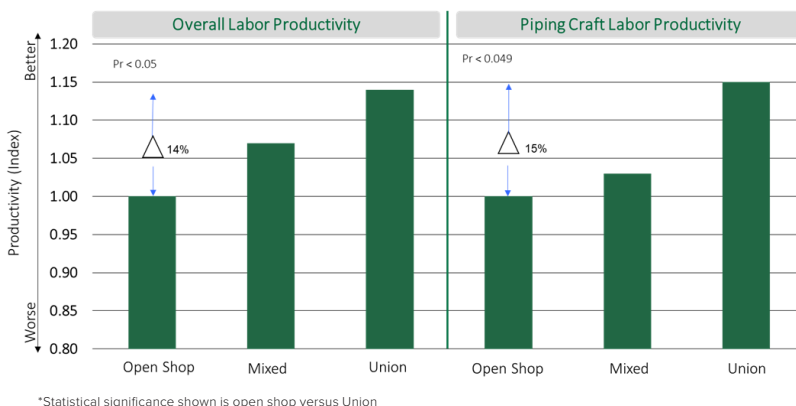


Figure 6

¹ Edward W. Merrow, *The Looming Labor Shortage*, presented at the UA/MCAA Labor Relations Conference, October 30, 2008.

average. Multiple factors drive this range, including the quality of planning, quality of project management, and workforce skill.

What Drives Good Union Labor Outcomes?

The difference between union and non-union labor comes down to better productivity for union labor. As shown in **Figure 6**, union labor projects have 14 percent better productivity than open shop projects overall and 15 percent better productivity for piping craft labor.

Labor productivity, in turn, is driven by three main factors:

- Skill level of the labor and supervision
- Deployment of skilled labor
- Stability of the labor

Union Workers Are More Skilled

Union workers have a higher level of skill than non-union workers. How do we know? When we asked owners to rate the skill of their project labor, we found that union workers were much more likely to be rated as above average or highly skilled than open shop or mixed labor. For example, 75 percent of project owners rated the craft of installing piping as above average or highly skilled for union workers compared to only 63 percent for open shop workers.

Projects With Union Labor Can Reliably Source Labor When Needed

The second difference between union versus open shop and mixed labor is the ability to reliably source labor when needed. Projects that sourced labor from union halls are 40 percent less likely to be short on skilled labor than projects that sourced labor from open shop sources or mixed labor. Skilled labor shortages create significant challenges for projects. Labor shortages are linked to worse cost and schedule performance, including increased risk of major cost growth and schedule slip.

Team Stability Is Another Key Factor in Project Success

Finally, we looked at the turnover of labor as another potential explanation for the higher productivity of union versus open shop labor. Projects that employ union labor report significantly lower monthly turnover rates for their workers than projects employing open shop labor. Projects employing mixed labor appear to benefit from the presence of union labor with lower turnover than projects

employing open shop labor. Again, labor turnover is linked to cost and schedule performance: higher turnover leads to worse performance.

Union Labor Leads to Better Outcomes Overall

The combination of higher skills gained through more consistent training and better deployment of labor from union halls along with lower turnover of craft once they are on the job helps to explain the significantly higher productivity of union labor, which, in turn, drives lower and more predictable project costs and better cost and schedule predictability. The presence of union labor in projects employing mixed labor is evident in nearly all of the key success measures; projects with mixed labor do not perform quite as well as those that use all union labor, but they do outperform open shop labor. Overall, employing union labor creates significant value for owners through lower costs and more predictable schedules and reduces the risk of major cost and schedule deviations.

Download the Full Report

This study was conducted for the Mechanical Industry Advancement Fund (MIAF), a national joint labor management cooperative committee established and operated by trustees appointed by the United Association of Plumbers and Pipefitters (UA) and Mechanical Contractors Association of America (MCAA).

[Click here to download the full report prepared by IPA.](#)



In-Person IBC 2023 Highlights

Market Trends, Remote/Hybrid Working, Fast Schedules, Construction Safety, and More

By Cheryl Burgess, Staff Writer and Senior Editor

The 2023 annual meeting of the Industry Benchmarking Consortium (IBC 2023) will be in person for the first time since 2020. The IBC and its focused sub-committees drive continuous capital project system improvement for the world's leading companies in the manufacturing, energy, and infrastructure industries. Held at the Lansdowne Resort in Leesburg, Virginia, on March 20 to 22, 2023, IBC 2023 includes new industry research study presentations, industrial sector breakout sessions, and project performance competitiveness briefings for large and site and sustaining capital projects. The annual meeting also provides opportunities for networking with attendees from other owner companies who are leading initiatives to improve capital project delivery.

IBC 2023 includes a keynote speech by IPA Founder and President Edward Merrow and the following new research studies:

Market Trends in Capital Projects

This research study outlines the state of the overall industry macroeconomic market condition and its implications on capital projects and project systems. We will discuss procurement and supply chain trends based on recent project data in IPA's proprietary database and also share the industry's perceptions on the supply chain, escalation trends, and engineering and construction labor market from our market survey.

Remote/Hybrid Working Models

The COVID-19 pandemic changed how project teams work together. Teams had to react quickly to adapt to change, and many of those adaptations have evolved over time from temporary solutions to the "new normal," with variable success. This study looks at how project teams have organized and adapted to the project work environment since the COVID-19 pandemic.

Fast Schedules

Following up on an IBC 2018 study on how (and why) to go fast at the project level, this study explores speed from the

system perspective: What are the organizational system constraints and enablers of going fast? This study will answer the following questions: What type of organizational structure promotes successfully schedule-driven targets? What planning action items need to happen and when to promote schedule-driven success? How important is the business sponsor and their continued role? What types of projects are inherently faster and what conclusions can we draw from the findings?

Construction Safety Performance

Over the many years that IPA has benchmarked construction safety, it has shown a steady improvement trend. However, over the last few years, that trend has plateaued. Although the averages have leveled off, IPA observes that some member companies achieve construction safety performance that is much better than average, which indicates that the current industry average does not represent some theoretical lower limit or that there is no room for continued improvement for most IBC companies. This study uses IPA's data to explain the relatively large gaps in performance between the companies with the best safety performance and the rest of Industry to provide IBC members with specific recommendations that the best performing companies implement to drive their superior results.

The IBC is a voluntary association of owner firms in the chemical, petroleum, minerals processing, food and consumer products, life sciences, pulp and paper, and power and infrastructure industries that employ IPA's quantitative benchmarking approach to improve the value from their capital project systems. Through benchmarkings of both large and site-based systems conducted by IPA, IBC member companies receive exclusive insights into how their capital project systems and project outcomes stack up against their industry peers with respect to safety, cost, schedule, and operational performance. Member companies agree to support the continuous improvement of their own capital processes through measuring and comparing performance metrics.



Project Viability Assessment (PVA)

Assess the Strength and Feasibility of Your Project's Business Case

- Understand your project's business case strength relative to the industry average and industry Best Practices at the end of the Business Planning phase or Conceptual Development
- Determine whether your project's business case is strong enough for the project to proceed to Scope Development
- Understand your project's cost and schedule competitiveness
- Determine whether your project's cost and/or schedule targets are too aggressive or conservative relative to its practices
- Identify potential risks to achieving the business case goals
- Identify critical deliverables needed to reduce the business risk to a *Best Practical* level

Contact Swati Bhat at sbhat@ipaglobal.com to assess whether your business case is strong enough to set your project up for success.

Carbon Working Group Tackles Social Responsibility and Abatement Performance Metrics in 2023

By Cheryl Burgess, Staff Writer and Senior Editor

The first 2023 bi-annual meeting for the Joint IPA-Industry Carbon Working Group (CWG) was held January 24, 2023, with participation from most of the 35 member companies. The CWG brings together companies from all industrial sectors to connect corporate sustainability goals with the capital projects that can make those goals happen. CWG provides an opportunity to hear concerns and make this corporate-to-projects connection happen effectively.

The goal of this CWG session was to align on the group's objectives for 2023 and to define and progress two main topics: social responsibility Best Practices and abatement performance metrics.

Social Responsibility

Capital project developments bring economic and employment opportunities to communities, but they also bring change and potential risks. Social responsibility forces businesses to examine how decisions and practices affect their customers, clients, employees, and local communities. How well companies/project teams engage with local communities and other stakeholders sets the stage for future success or long-term problems—including failure—for an asset.

It is important to note that IPA's goal in this area is not to drive a company's corporate social responsibility strategy but to understand how it influences decisions related to capital projects. IPA has been collecting social responsibility data on megaprojects for almost a decade now. During the January CWG meeting, the goal was to highlight the database IPA has developed over the years and to understand what key outcomes are driven by these practices.

Some of the social responsibility Key Performance Indicators (KPIs) we have seen include the number of jobs created, CAPEX invested in local infrastructure development (schools, roads, etc.), local skills developed, and training provided. Local content requirements are often used as a metric as well. These data can help us understand the success of social responsibility efforts.

Abatement Performance

Low carbon scope selection is a structured process to identify and assess alternatives to avoid or reduce emissions from a certain baseline. Industry has applied different frameworks in the past to improve performance in other areas, such as cost, without losing functionality. These took the shape of Competitive Scoping or Lead Scoping or Value Improving Practices. Low carbon scope selection is a similar process but with the goal to reduce emissions.

IPA's goal in this journey is to assist sites and assets in choosing the optimal decarbonization alternatives to meet their future targets. Optimal solutions are usually those that achieve the lowest greenhouse gas (GHG) emissions and highest net present value (NPV). However, depending on the context, several other criteria are used in the screening process, including technical feasibility; space and topsides weight considerations; operability limits; nearby infrastructure; system reliability; and prior experience of the industry, owner, and contractors.

IPA introduced a high-level development pathway for progressing this topic. The first phase is to provide baseline performance metrics for common abatement alternatives. The metrics evaluated for each alternative will be cost (CAPEX and OPEX), schedule, and GHG-reduction potential.

The Path Forward

Companies may differ in their ambitions and current pursuit of social responsibility and low-carbon scope selection, but all companies will have to think critically about these topics and make tangible progress in the next few years. IPA and CWG members collectively have the data and knowledge to enable effective decisions. The next step is to work together to make sure we are solving the right problems, at the right time, to enable the right decisions.

Contact Adi Akheramka at aakheramka@ipaglobal.com to learn more about how your organization can join the Carbon Working Group.

CCUS Project Cost & Schedule Norms

What is the industry's actual cost and schedule performance for carbon capture, utilization, and storage (CCUS) projects? How do CO₂ concentration and design capacity drive performance of each scope element from capture to injection? IPA has answered these questions through a joint industry research study completed in early 2023. CCUS owners and investors now have the opportunity to access the data and use it to establish a baseline for industry performance, understand the competitiveness of opportunities, and identify areas for continuous improvement.

Contact Adi Akheramka at aakheramka@ipaglobal.com to get access to this industry report!



Transitioning to New Energy: An IPA Energy Company Survey

By Jonathan Walker, Senior Research Analyst

Achieving net-zero emissions will require several significant actions, many of which involve redefining capital project portfolios that are shaped to meet climate objectives. These new era portfolios include opportunities that range from renewables to carbon capture and storage (CCUS). Challenges abound and are diverse: needed to achieve these goals are advances in technology to make projects viable, robust supply chains, expansive policy support, and people skills, to name a few. Given these challenges, we need to better understand where the energy industry is with regard to portfolio strategies and gated processes. IPA's research shows these are critical components to project success and, therefore, if we can identify areas of improvement, the industry is more likely to achieve its net-zero emissions goals.

New Technology Risk Analysis

Data-Driven Insights to Help You Deliver Successful New Technology Commercialization Projects

- How likely is my new technology project to come in on-time and produce at the planned production level?
- What are the chances of a significant cost overrun, schedule slip, or serious product shortfalls?
- How much contingency is needed to achieve the desired level of predictability?
- What are the technology-related project risks and what is driving them?
- What can be done to reduce the risks?
- How much additional time and/or money is needed for risk reduction, and is it worth it?
- What are the realistic production expectations for the first year?

Contact Michael McFadden at mmcfadden@ipaglobal.com to start a discussion!

To understand the extent to which companies are changing their portfolios as they move toward a more sustainable future and to understand the perceived areas of difficulty for developing renewable projects, IPA recently surveyed a number of our energy clients.

Results From Our Survey of Energy Clients

Fifteen energy companies—including majors, national companies, and independents—responded to our new energy survey. Survey topics included portfolio strategies for new energy projects, external and internal barriers to project success, and governance for early decision making.

Portfolio Strategy

Most of the responding companies (80 percent) are involved in renewable energy implementation at some level. On average, the energy industry ranked developing renewable energy as a new business area as very important to the future. (See **Figure 7**.)

External and Internal Barriers

Survey respondents identified many external barriers to company energy transition plans, with a few standing out. These barriers include market trends (e.g., difficult project economics), permitting constraints and unfavorable regulatory policies, and supply chain limitations, as well as lack of contractor expertise, technology advancements, government support, and existing infrastructure. It is also worth noting that no single barrier was identified by more than 42 percent of the respondents. (See **Figure 8**.)

Companies identified supply chain limitations as a major risk to renewable energy projects, with the heated market, lack of growth among suppliers, lack of supply chain maturation, future climate change risks, supply chain consolidation, current environmental risks, and lack of technology advancements all being rated as moderately significant to very significant risks.

Permitting also ranked high as a risk. Permitting is in a dynamic state as regulatory environments around the world are often unclear and constantly evolving, leading to unpredictable environmental approvals. This contributes significantly to the challenges that renewable energy projects must overcome by increasing their shaping complexity.

Governance Processes and Early Commitment

Marginal economics are clearly a major hurdle for renewable energy projects. The less than stellar economics and the barriers expressed in the survey suggest the importance of establishing a clear and disciplined stage-gated process that takes into account the business drivers of renewable investment and the many shaping issues that need to be addressed by the project sponsors. In addition, these projects have a need for Basic Data while at the same time, in many cases, they are forced to commit to the investment at a very early stage of project development (early commitment).

To understand what gated processes companies are employing on renewable energy projects, we asked the companies surveyed whether their renewable energy project follow a gated process—and if they do, is it the same process that other projects follow? As shown in **Figure 9**, the majority of energy companies (60 percent) indicated that renewable energy projects do follow a similar process. However, these similar processes are sometimes expedited or in development, and in some cases, they are simply bypassed by management. The other 40 percent either do not follow a process at all or follow some different kind of process.

The Path Forward

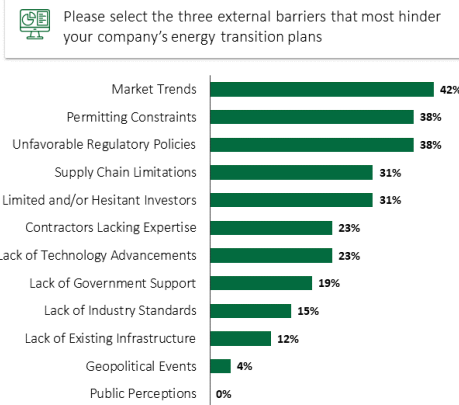
IPA is actively helping our clients with this challenge and will continue to evolve our product offerings to address the increasingly complex project landscape. For additional information on how the gated process should be designed for early commitment projects, such as offshore wind and other renewable energy projects, see Pam Wertz's article entitled [Mitigating Risks of Early Commitment in New Energy Projects](#).

Given your company's current and 10-year forecast renewable energy portfolio, please indicate the priority of investment in each of the following technologies:

1 = **Low Priority** for Investment
2 = **Medium Priority** for Investment
3 = **High Priority** for Investment

Technology	Average Rating
Green Hydrogen	2.36
Onshore Solar	2.00
Offshore Wind	1.50
Onshore Wind	1.42
Geothermal	1.05
Offshore Solar	0.92

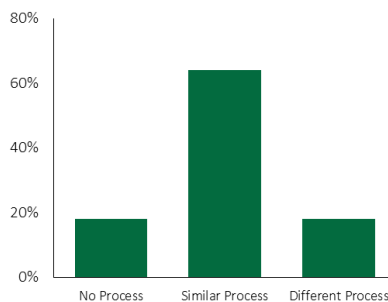
Figure 7



- Significant variance in survey responses:
 - No single response was selected by more than 50 percent of companies
- Difficult project economics are driving several market-related concerns
- Permitting and regulations are clearly challenging for the industry

Figure 8

Do your renewable energy projects follow a gated process? If yes, is it different from the gated processes other projects follow? Please explain.



“[The process] is developing, in due course we expect a gated process similar to the rest”

Follows an expedited approval process

Projects bypass the process continually by management override”

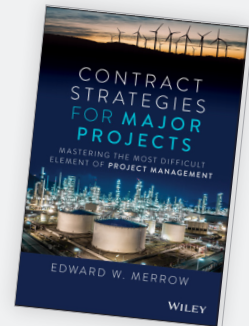
Figure 9

IPA Announcements



Project Contracting Strategy: Edward Merrow's New Book Brings Data and Facts to the Discussion

IPA is pleased to announce that IPA President and CEO Edward Merrow's latest book, *Contract Strategies for Major Projects*, is now widely available for purchase! The book fills a long-term void in project management by bringing data-driven insights and facts to the topic of project contracting strategy. Order from your preferred book retailer today!



Pam Wertz's Early Commitment in New Energy Projects Article Republished by JPT

The Journal of Petroleum Technology (JPT), a Society of Petroleum Engineers (SPE) publication, recently republished an article by IPA Chief Development Officer Pam Wertz, *Mitigating Risks of Early Commitment in New Energy Projects*, on its website. Originally published in the December 2022 IPA Newsletter, the article is based on research presented at IPA's annual Upstream Industry Benchmarking Consortium meeting in November 2022 (UIBC 2022). It outlines how understanding and mitigating the risks of early commitment in new energy projects is the key to their success.



Joseph O'Brien Appointed to Mining, Minerals & Metals Manager Role

As Business Area Manager of Mining, Minerals & Metals (MMM), Joe is responsible for strengthening IPA's relationships with global clients investing in capital projects in the MMM sector. He will continue IPA's development of cost and schedule benchmarking for MMM projects and build on IPA's capability in delivering key insights into the MMM sector for our clients.



Giving Back to Our Local Communities

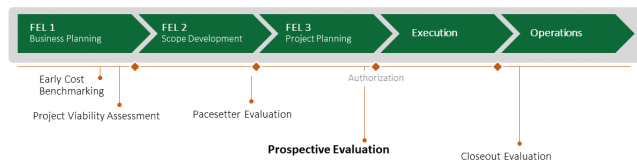
One of IPA's founding principles is a commitment to fulfilling our social and ethical responsibilities to the communities in which we work. The easing of pandemic restrictions allowed IPA employees to return to in-person community service events at our offices across the globe in 2022.

Visit www.ipaglobal.com to read highlights of IPA's community service efforts in 2022.

Closing the Planning Gaps for a Food Production Project

The Problem A project manager for a food and consumer products company in Asia Pacific approached IPA for help with a greenfield food production project that had interdependencies with a related project. The project manager wanted IPA to help identify the blind spots in execution planning as well as other risks the project was facing. The project manager was especially concerned because the project team lacked experience in large capital project execution. In addition, because the company had already approved the project's funding early in the project lifecycle—what we call *de facto* or early authorization—time was running out for the project team to close the planning gaps.

IPA'S Approach IPA was engaged to do a Prospective Evaluation. As shown below, IPA's Prospective Evaluation takes place before a project is authorized in preparation for the final decision gate.



The goal of IPA's Prospective Evaluation is to reduce execution risk. In this analysis, we gain insights into risks to project execution success by answering these questions:

- What are the gaps in project definition?
- Is the team fully developed and aligned?
- Are the project's cost, schedule, safety, and operability targets achievable?
- Are there specific risks to achieving the project's objectives?
- How can the team reduce risk?
- *Is the project ready to proceed into execution?*

Given this project's particular needs, we realized that, in addition to answering the questions above, we would have to take a more consultative approach. To best help this project manager prepare for a successful project, we knew we had to act quickly to help the team understand the risks they had missed—and the potential consequences if they did not act to mitigate these risks. Thus, in addition to IPA's standard Prospective analysis, this IPA project

engagement doubled as a workshop to educate the team on industry Best Practices. During the workshop, team members were encouraged to ask questions and critically assess the current project state. This allowed us to foster a collaborative environment with a relatively inexperienced team that had not worked with IPA before. Workshop learnings were applied to the current project and could also be helpful for future projects.

A major risk that we identified for the project was the lack of a comprehensive project execution plan. As the project manager suspected, this area of concern did turn out to be a major risk to the project. Thus, for this engagement, during the workshop, we discussed how to apply Best Practices for project execution plans to the current project.

These Best Practices include having:

- Management of change
- Vendor quality assurance
- Engineering management
- Procurement management
- Risk management
- Site material and temporary facilities management
- System turnover sequencing
- A detailed, level-three CPM resource-loaded schedule

In addition, we identified issues with the joint venture (JV) partner that had the potential to have major effects on the project's cost and schedule outcomes. The decision to execute the project under a JV agreement created significant capital savings for the client but also meant there were more interfaces to manage, which the project team did not anticipate and was not prepared for, adding to the cost and schedule risk. Recognizing this additional risk allowed the team to develop mitigation measures to manage it.

How It Turned Out: Our close collaboration with the project team allowed us to drive the urgency and need to strengthen the project's execution planning. We provided the team with actionable recommendations to address the JV issues (developed from our understanding of their constraints and project environment) that they could implement to reduce their risk exposure.

Through this consultative Prospective project evaluation engagement, we were able to help the team address the project's specific risks and help better set it up for success. In addition, the team learned Best Practices that they can use for future projects.

IPA Events and Presentations

Industry Benchmarking Consortium (IBC) EMEA

May 3-4, 2023

Vienna, Austria

The IBC EMEA (Europe, Middle East, and Africa) will take place in Vienna, Austria from the 3rd to 4th of May 2023. Attending companies will compare key performance and practice metrics—for both large and small projects—to understand how well their efforts to improve capital efficiency compare to their peers. In addition to metrics, IPA will also share new research addressing key topics of interest within the industry. The research studies will be selected based on the response from the US IBC conference, held in March 2023. Contact Andrew Griffith at agriffith@ipaglobal.com for more information.

Upstream Cost Engineering Committee (UCEC)

June 15, 2023

Houston, Texas

The UCEC strives to improve upstream project and business results by providing metrics for better cost engineering. Member company representatives gather once a year to learn about and review new UCEC metrics packages prepared by IPA. The upstream metrics packages are used by companies to compare their upstream project cost and schedule outcomes with industry cost and schedule norms and, in general, boost business project estimate assurance and evaluation quality. Contact Shubham Galav at sgalav@ipaglobal.com for more information.

Cost Engineering Committee (CEC)

September 19-20, 2023

McLean, VA

The CEC assists cost engineers by providing metrics and tools that offer an unbiased snapshot of industry cost and schedule estimates and trends. The CEC focuses on all aspects of cost (or investment) engineering, including cost estimating, scheduling, and project control practices and metrics, with the goal of expanding the owner cost engineer's capabilities. The primary vehicles for accomplishing these objectives are validation metrics, Best Practices research, and practice sharing. Contact Shubham Galav at sgalav@ipaglobal.com for more information.

Upstream Industry Benchmarking Consortium (UIBC)

November 13-15, 2023

McLean, VA

The UIBC provides an independent forum for each participating exploration and production (E&P) company to view key metrics of its project system performance such as cost and schedule, Front-End Loading (FEL), and many others against the performance of other companies and share pointed and detailed information about their practices. The consortium highlights Best Practices, reinforcing their importance in driving improvements in asset development and capital effectiveness. Contact Andrew Griffith at agriffith@ipaglobal.com for more information.

2023 IPA Institute Course Schedule

In-Person Courses	Dates	Language	Click to Register
Project Management Best Practices Houston, Texas	May 15 & 16	English	REGISTER
Contracting Strategies for Major Projects Abu Dhabi, United Arab Emirates	October 9 & 10	English	REGISTER
Virtual Courses	Dates	Language	Click to Register
Front-End Loading and the Stage-Gated Process	April 4 & 5	English	REGISTER
Best Practices for Site-Based Projects	April 10–14	English	REGISTER
Project Stakeholder Alignment Through Successful BEAM Implementation	April 19	Spanish	REGISTER
Megaprojects: Concepts, Strategies, and Practices for Success	April 24–28	English	REGISTER
Project Stakeholder Alignment Through Successful BEAM Implementation	May 3	English	REGISTER
Capital Project Execution Excellence and Project Controls	May 9 & 10	English	REGISTER
Project Stakeholder Alignment Through Successful BEAM Implementation	May 24	Portuguese	REGISTER
Front-End Loading and the Stage-Gated Process	June 6 & 7	English	REGISTER
Best Practices for Site-Based Projects	June 12–16	English	REGISTER
Gatekeeping for Capital Project Governance	June 27–29	English	REGISTER

About the IPA Institute The IPA Institute is the training and education division of Independent Project Analysis (IPA), the world's leading advisory firm on capital projects. Our courses equip industry leaders and capital project practitioners with Best Practices for projects, portfolio, and project system management/delivery. All course instruction, presentations, and supplementary course materials are rooted in IPA's unparalleled capital project knowledge and research, and based on data from IPA's proprietary project database.



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