

IPANewsletter



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Mitigating Risks of Early Commitment in **New Energy Projects**

By Pam Wertz, Chief Development Officer

Because of their characteristics, business often commits to new energy projects early in their life cycle, which increases the risk of project failure. Understanding and mitigating the risk of these early commitment projects is key to their success.

What Are Early Commitment Businesses?

For most industrial projects, especially those producing commodities, the precise timing of when the business commits to a project is a matter of corporate governance regarding risk. Most industrial projects are committed at the end of scope development and before front-end engineering and design (FEED). The final investment decision (FID) is taken after FEED, but the actual decision to proceed happens at the end of scope development and is only reversed at FID if something fundamental has changed.

A few industrial businesses, however, are routinely required to make binding commitments to a capital project before the end of scope development because they are in a bidding competition. These businesses include air separation, hydrogen supply projects, pipeline projects based on competitively bid tariffs, some solar photovoltaic projects, and some wind projects. When a business has to commit to a project prior to full completion of scope development, substantial risk is added to the project. It is important to understand and mitigate that risk early so that a more precise estimate can be established as the basis for the early commitment decision.



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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.
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Early commitment is not fast tracking. Although business commits to an opportunity during scope development, these projects complete the remaining definition activities after commitment to continue minimizing risk prior to beginning execution. In contrast, fast track projects skip definition activities and often merge assurance gates in hopes of achieving faster front-end work and the ability to start execution sooner. These projects have much higher risk profiles than projects with all front-end work completed.

What Does the Early Commitment Project Development Process Look Like?

Traditional projects follow a stage-gated approach that includes Front-End Loading (FEL) 1, in which the team appraises the opportunity before selecting the scope at FEL 2A. Scope development is completed in FEL 2B, followed by FEED activities and FEL 3 such as execution planning. If the governance process is working, decisions are made at the gates that separate these phases. Business commitment happens at the end of FEL 2B and the final investment decision (FID) is taken at the end of FEL 3.

As shown in **Figure 1**, for early commitment projects, the typical commitment window comes earlier—normally between the end of FEL 1 and the middle of FEL 2. Thus, at FEL 2A, when the scope would be selected for a traditional project, the business is already committing to these early projects. Early commitment projects cannot get through the entire scope development process before that early business decision has to be made. Getting through both FEL 1 and 2 before the authorization decision is the best case scenario, but often projects only complete about one-third to one-half of FEL 2 before business needs to commit to a project cost and schedule estimate. The earlier the commitment is made, the higher the risk. Because commitment occurs earlier, the FEL 3 gate becomes a check gate to ensure the project is prepared to execute.

What Are the Key Elements to Reduce Risk?

Committing to a project before the end of scope development adds substantially to the risk of cost growth and schedule slip. The amount of risk added depends greatly on the portion of the scope that is fully standardized. Early commitments without a standardized scope are likely to be failed projects, unless they are very high return projects. Unfortunately, renewables projects subject to reverse auction bidding tend to be low return projects with moderately high risk. They compete with utility projects that are largely done with guaranteed returns on capital. When returns are low, even a modest cost overrun can render a project NPV negative.

Early commitment projects face risk because of the unknowns they include at the time of business commitment to the project. The biggest risks leading to potential value loss during the maturation of an opportunity include shaping, supply chain, and technology. The more unknowns a project has, the higher the risk it faces. Thus, it follows that reducing the project's unknowns reduces the risk. What are the key elements for project teams to do this?

One way is to use as much standardized design as possible. On typical early commitment projects, 60 to 80 percent of the total project cost is based on fully standardized kit—and the supply chain for that kit is fully developed and subject to binding commitments if the bid is won. Leveraging standardized design allows projects to move much more quickly through FEL than traditional projects.

Another key to risk reduction is to quickly identify and evaluate the portion of the project that cannot be standardized, as well as potentially risky local conditions. This includes:

- The regulatory regime and how it affects schedule
- Site conditions like soils and hydrology
- Local logistical challenges such as access and materials management
- Permitting, bonding requirements, local content requirements, etc.

What Work Process Changes Are Required?

As projects progress through FEL, cost accuracy improves (see **Figure 2**). For early commitment businesses, project definition activities must be moved up to enable development of more precise estimates during FEL 2 in support of these commitment decisions—the work process is adjusted to get essential work done in the time available (everything that is non-standard). In general, key activities are moved up one stage. No activities are eliminated as part of the front-end work and the importance of each activity remains the same—some activities are simply done earlier. Although the sequencing of activities is not ideal, it is the best that can be accomplished within the constraints of early commitment.

As shown in **Figure 3**, in early commitment projects the core team is formed and business case established in FEL 1 instead

Business Authorization Happens Sooner for Early Commitment Projects

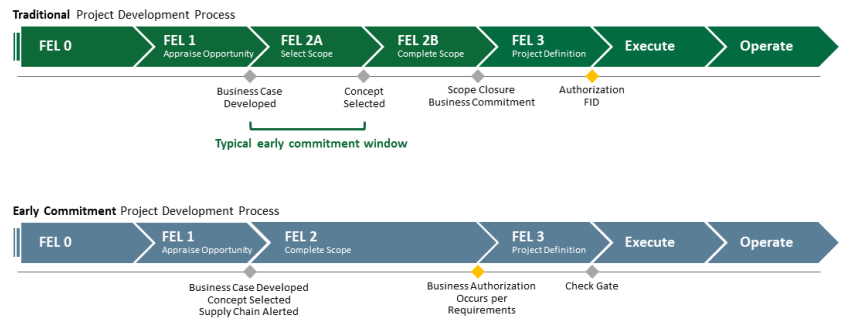


Figure 1

As Projects Progress Through FEL, Cost Estimate Accuracy Improves

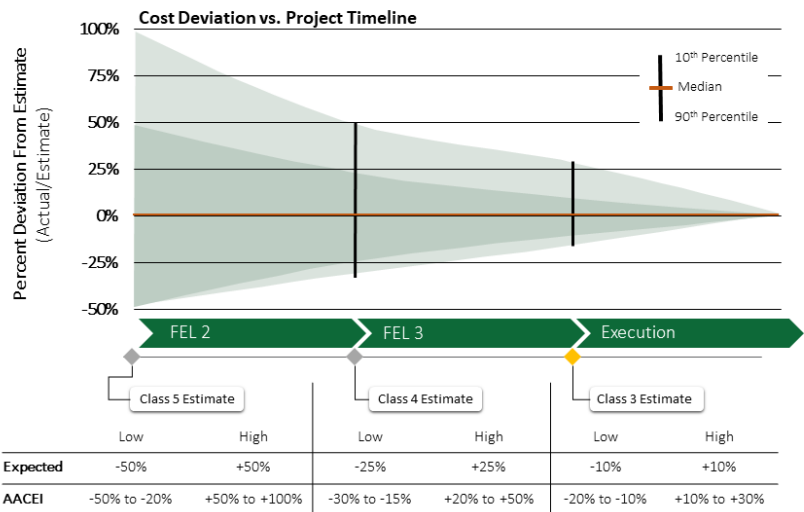


Figure 2

Most FEL Work Shifts One Phase Earlier for Early Commitment Projects

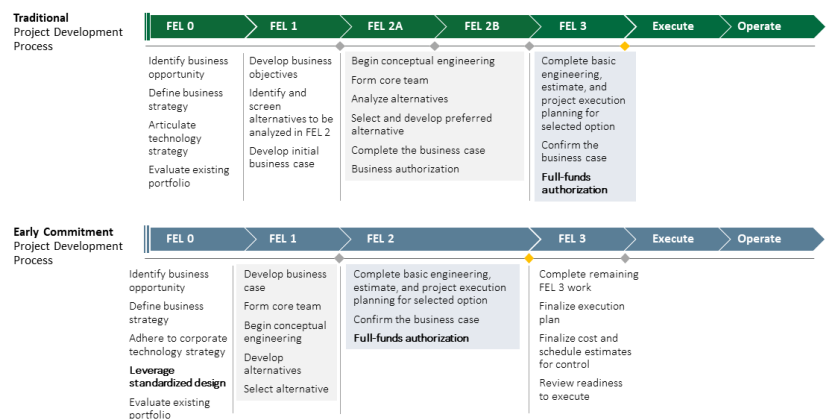


Figure 3

of FEL 2. The scope alternatives are developed, concept selected, and conceptual design begins in FEL 1, not in FEL 2. The team then develops a project execution plan and cost and schedule estimates that consider all site-specific risks in FEL 2, and prepares the project for full-funds authorization during this phase. Several characteristics of early commitment projects position them for success in execution.

Leverage extensive FEL 0 work. Standardized design allows projects to enter FEL 1 with a more comprehensive and complete FEL 0 package. Standardization enables pre-defined scope for viable options, already complete Value Improving Practices for standardized elements, technology evaluation that is mostly complete, and a standard supply chain that can be initiated early.

Form an integrated cross-functional project team in FEL 1. This typically happens in FEL 2 for traditional projects, but for early commitment projects, the core team should be assembled around the middle of FEL 1. More experts and specialists can be added to the team in FEL 2.

Investigate and evaluate all potential project killers first. All sources of cost growth outside the standard kit are evaluated to the extent that time allows. The extent of risk reduction and its implications are communicated to the business sponsor in real time. The team then does as much work as possible and communicates the remaining risks so business can make an informed decision on whether to move forward.

Fully understand the site requirements. This is critical to risk reduction for early commitment projects and the minimum requirement to make an early commitment. Site issues are the one thing that could kill the project because they cannot be standardized. For early commitment projects, the site investigation initiates in FEL 1, rather than FEL 2.

Maintain the discipline to complete FEL once the project is approved. Continuing the FEL work, locking in the design basis, finalizing all the planning, and getting estimates to a control-grade level is still important after the full project commitment is made. The check gate at the end of the traditional FEED period ensures the project is ready for execution. If the business sponsors have low regard for the project work process or if governance is weak, projects start execution without complete FEL work, with disappointing results, especially for low-return early commitment businesses.

Employ strong governance. A governance process must be in place, and must be adhered to and strictly enforced through the projects organization. Do not skip FEL requirements and do not merge assurance gates.

Leveraging Strategies at the Portfolio Level

What leveraging strategies can companies use at the portfolio level to position themselves for success in early commitment projects? The more work done at the portfolio level, the better positioned the project will be going into FEL 1. Having more FEL 0 work done is one of the ways to gain some speed as project teams are defining these opportunities.

First, establishing effective resourcing strategies creates a solid foundation for projects early in development. Because FEL 0 is more defined than for traditional projects, companies are able to capitalize on FEL 0 activities by establishing an FEL 0 program for every early commitment technology. This is analogous to an exploration process for renewables businesses. These FEL 0 teams develop basic data and information for a particular technology, agree on the concepts and viable scope alternatives, develop a standardized supply chain, and then continuously look over that portfolio for opportunities to invest.

The other thing that companies can address in terms of resourcing at the corporate level is in the approach to the make-up of the front-end team. Companies could develop a staffing model for each type of renewables project in which a core team completes early FEL 1 work to develop the business case. In this scenario, FEL 1 can move forward much more quickly because no time is required to establish the initial working team. A small integrated cross-functional team is formed in the middle of FEL 1 to continue with the project's scope development.

For each renewables business, companies need to **select a technology strategy**. There are two basic strategies to choose from at the corporate level. The first strategy is to innovate continuously. This means a company is always seeking to be on or close to the cutting edge. To maintain this strategy, companies need people who are up to date on technical innovation. The alternative is to adopt a technology model, standardize it, work the supply chain around it, and then innovate only in the background until the company is ready to launch the next model or version of the technology.

Either approach is workable, but each carries its own risk profile and level of investment. Continuously innovating provides higher risk projects and a harder to standardize supply chain with a high level of technology investment, but ensures that the company's technology is competitive. For the second model, however, companies risk being left behind if the technology is so fast moving that innovation rapidly makes last year's technology uncompetitive. The upside is that lower investment is required for this approach.

The only approach that is completely unworkable is for companies to make no strategic choice. Doing nothing means each new development will be a technology selection crisis with insufficient time to make a considered decision. Companies need to develop a strategy to follow most of the time.

Companies can **standardize activities at the portfolio level** to position projects to enter FEL 1 with a more complete FEL 0 package. By pre-baking as many decisions as possible, project-specific definition activities are reduced and individual risks are mitigated more quickly. Several areas mentioned previously present opportunities for corporate-level standardization: opportunity assessment, technology development strategy, overall supply chain or key supply chain elements, and project team staffing model. In addition, the maintenance approach—to the extent that it affects capital—can also be standardized.

Modifying the work process at the corporate level can help teams move more efficiently through the definition of the project opportunity and position early commitment projects for successful execution.

Running some project steps in parallel is one strategy. As mentioned earlier, all definition steps are important—none should be eliminated from the definition workflow. However, some steps can be done concurrently to finish the work more quickly. Doing things in parallel in the pre-bid period helps projects get to a decent level of definition before the company submits a bid.

It is also important to establish a pacing strategy at the portfolio level. Teams need to understand how quickly they can move through definition of key issues. Each business could rework a definition roadmap and apply it to its specific opportunities.

Another strategy to optimize time and further minimize risk is to **use the downtime after bid submittal** to complete more definition work. At the same time, the company has to evaluate risk versus reward and consider how to lower

the risk profile while not putting too much work into it in case the project does not move forward. If this additional definition work does not plug gaps open at the time of bid and significant risk remains, the company should consider withdrawing the bid if the contest allows.

Do you need help with mitigating risk in your early commitment projects? Contact Pam Wertz at pwertz@ipaglobal.com to start a discussion with IPA.



Deliver Successful & Competitive Renewable Energy Projects

Since 1987, IPA has been a trusted advisor to companies in all energy sectors, and we have been at the forefront of the energy transition within the capital projects industry. With rapidly growing investment in renewable energy projects, it is important for companies to optimize their project systems and organizations with the right structures and Best-in-Class practices to manage their growing portfolios effectively.

Contact Carlos Tapia at ctapia@ipaglobal.com to discuss how your company can make the right improvements to deliver successful renewable energy projects.

Case Study: Using IPA's CSRA to Support Investment Decision Making for a Megaproject

By Tyler Griswold, Advanced Associate Project Analyst, and Luke Wallace, Director, Project Research Division

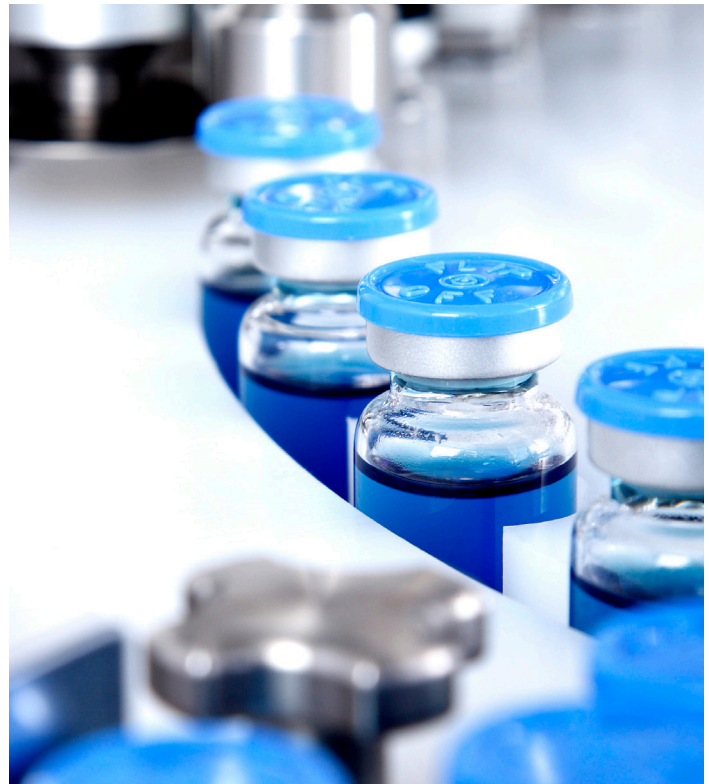
The Backstory

A pharmaceutical company approached IPA looking for insights on the cost and schedule risks associated with a large investment that was approaching full-funds authorization. The project was scoped into a multi-phased megaproject intended to increase production to meet growing market demand. Due to the scale of the project and uncertainty around the supply chain (contractors' capacity and capability, material prices, etc.), the company wanted a better understanding of the expected risks, as well as the likelihood of the project coming in on time and on budget.

Our Approach

Cost and schedule risk analyses are used by most industry (large) capital projects to estimate the amount of cost and schedule contingency needed to center the base estimates and deterministic schedule. IPA has seen significant variability in the level of maturity across owner companies in terms of implementation of these cost and schedule risk analysis Best Practices. For example, we see project teams conduct purely qualitative risk analysis on schedule, basic quantitative analysis that includes the traditional activity range estimating, modern quantitative analysis that includes risk drivers specified by probability and effect and assigned to all activities they affect, and finally the advanced integrated cost schedule risk analysis.

Getting any of these methods to work is hard. For example, one of the challenges in getting a Monte Carlo schedule analysis to work is estimating correlations between activity durations in an effective fashion. Similarly, Monte Carlo-based methods for cost contingency setting fail because, while they focus on individual cost element distributions, cost estimates overrun because some scope elements were not defined—not because the distribution around the individual elements was incorrect. Most industry projects use fabricated distributions that are not based on historically observed and unbiased distributions of outcomes. Additionally, these analyses do not take into account the reality that most project elements are closely connected.



Finally, even in cases where the P50 identified by project teams employing risk quantification Best Practices appears reasonable for a particular project, the range around it is often too narrow—usually by a significant margin. Because of these narrow bands of forecast cost and schedule outcomes, projects—notably megaprojects—are often unpleasantly surprised at how bad things can get.

IPA's approach to quantifying cost and schedule risk is very different because we let history tell us what to expect. Using our database of over 22,000 capital projects, we trained machine learning algorithms to quantify how design maturity, estimate quality and bias (usually too low), planning gaps, and scope- and location-specific characteristics correlate with cost growth and schedule slip. The value here is that across so many projects, we know what the real distribution of outcomes looks like and can present true, unbiased reflections of what is most likely to happen.

For the pharma megaproject in question, the models were calibrated using a set of comparable pharma projects with like processing and facility attributes. That is the first step.

Next, we evaluated the status of the front-end engineering and design work (FEED) and project execution planning—the primary drivers of risk beyond size and scope. IPA's FEL Index—the composite measure of FEED and execution planning maturity—was assessed and we found

the FEED and planning work were about as good as they can get, which in our risk model means less contingency and narrower ranges.

For reference, “about as good as you can get” means the process design work was done, plot plans were issued for design, P&IDs were complete, a sized equipment list with firm quotes was developed, and so on. In addition, the project team was aligned (with clear roles and responsibilities) and included all key project functions. Finally, the team had detailed engineering, procurement, construction, and execution plans; a detailed Level 4 schedule loaded with critical engineering and construction resources; and control and handover procedures and requirements. In other words, the team members knew exactly what they wanted to build and how they were going to build it. Definition like this before authorization, unsurprisingly, is highly correlated with precise cost estimates. This is noteworthy because we often see megaprojects with gaps in the FEED work and execution planning. Boon number 1 for the project!

Finally, we benchmarked the project’s cost and schedule. Often, even very detailed and thought-out cost estimates and project schedules benchmark very aggressively. That is, when we compare the cost and schedule estimates to what Industry typically pays in cost and takes in months for a like scope, the estimates are well below the norm, indicating a big risk for the project. For this pharma megaproject, our benchmarks indicated that the team had set a reasonable cost target. Boon number 2!

Benchmarks indicated that the team had set a reasonable cost target

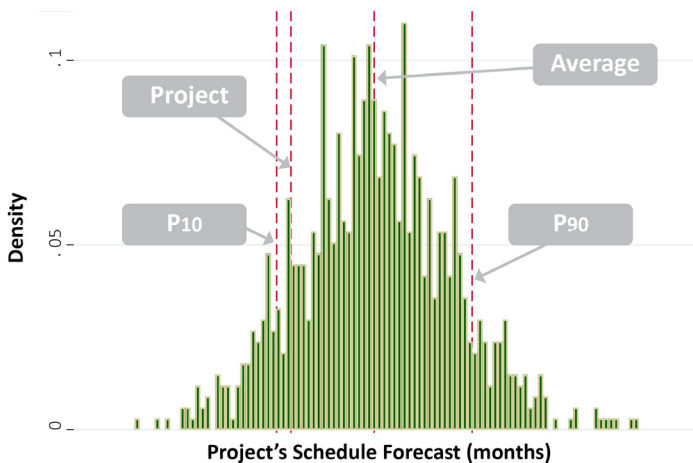


Figure 4

The schedule, however, was another story. Like our risk algorithm, IPA maintains scope-based cost and schedule benchmarking algorithms. The algorithms predict cost and schedule based on size and scope characteristics. In this case, the schedule target sat at around the 15th percentile. (See **Figure 4.**) In other words, based on empirical performance for like projects, the schedule had a less than one in six chance of success. Meeting it was not impossible—but also not very likely.

How It Turned Out

The schedule risk that IPA identified was a big eye opener for the team. In addition to the low probability of meeting the target, the range around IPA’s P50 impressed upon the team that the odds of delivering the project as planned were too low. As a result, the team worked with the business sponsor to relax the schedule expectation and devised a visibility and reporting process to ensure any delays—big or small—were identified in real time to promote timely intervention. The project is on-going and still on track, all facilitated by the benefit of history.



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 Aditya Munshi at amunshi@ipaglobal.com to find out if your next project will come in on-time and on-budget.

UIBC 2022 Brings Member Companies Together Again in Person

By Cheryl Burgess, Staff Writer and Senior Editor

Independent Project Analysis (IPA) held its annual meeting of the Upstream Industry Benchmarking Consortium (UIBC) from Monday, November 14 to Wednesday, November 16, 2022, at the Hilton McLean Tysons Corner in McLean, VA. The 3-day conference featured research presentations and working sessions for upstream sector owner companies that benchmark their capital projects with IPA. In addition to presenting new research, UIBC included company breakout sessions and in-person client meetings and a demonstration of IPA's Upstream Team Staffing Assessment and TrueCost Opportunity Benchmarking Software.

Below we highlight the new industry research and focused topic sessions that were delivered exclusively for the first time during UIBC 2022:

FOCUSED TOPIC: Executing in the Disrupted Market

Ongoing E&P projects are experiencing multiple challenges in today's turbulent market environment. Projects are slipping, and project teams seem unable to meet stage-gate requirements. Problematic areas discussed include contracting environment, supply chain disruptions, downsized project organizations, and increasingly complex portfolios. Although the current market cycle characteristics are not entirely the same as past cycles, IPA's previous research can be used to navigate the current environment. This presentation outlines solutions to overcome difficulties in the challenged areas using IPA's previous research.

RESEARCH STUDY: Production Attainment

Lessons Learned Actual hydrocarbon production is the ultimate asset outcome for all E&P companies—it is how they generate returns on their capital investments. IPA has previously shown that industry production attainment is around 80 percent, a metric that has not changed over the last two decades and has been a significant contributor to project NPV erosion. This study unravels some drivers of poor production performance and the lessons learned that can be implemented to improve the likelihood of meeting production goals. Ultimately every function, including business, has a role to play in improving this performance.

RESEARCH STUDY: What Makes a Good PEP? Industry's

Project Execution Planning (PEP) has not improved over the last 20 years. Although schedule definition is a key component of the PEP rating, several other deliverables also contribute to the definition of this FEL component. In this study, we look into the deliverables that underpin execution planning and propose an updated operational definition of what makes a good PEP.

RESEARCH STUDY: Common Scopes, Common Challenges: Are We Identifying and Planning for These Risks?

Over the past 5 years, IPA has seen site and sustaining capital (SSC) offshore revamp projects continue to fail and systems continue to be out of control. Only a small fraction of these projects are competitive and predictable, which is the ultimate goal for most businesses. This research study aims to understand scope-specific issues for the most common offshore revamp projects and gain an understanding of the typical issues these projects face across all scopes.

RESEARCH STUDY: New Energy Organization

of the Future As the energy industry expands from a focus on fossil fuels, conventional refining, and petrochemicals to new and more diverse sources of energy and products, there is an increased focus on decarbonization for new and existing assets. These shifts mean that, as companies change the way they manage their legacy businesses, they are also developing new lines of business that come with different markets, partnerships, and competitors. Although every company's energy transition journey is different, change is inevitable, and the decisions made by the industry today about how to organize and structure the project system will have lasting implications for years to come. In this session, IPA describes how the industry is approaching the energy transition so far from an organizational perspective, the implications these transition decisions have for the project system, and the issues companies need to be mindful of as they continue to shape their energy project organization of the future.

SURVEY RESULTS: Transition to New Energy

Renewable energy has become a critical part of the energy industry as companies continue to evolve their portfolios toward a sustainable future. IPA has surveyed many of the world's preeminent energy companies to understand the challenges they face during this time of transition. This presentation covered the highlights of the survey results and was followed by a renewable energy breakout session to dive into further details.

RESEARCH STUDY: Early Commitment in New Energy Projects The cost of entering renewables businesses is built around early commitment to projects, rather than the standard approach to final investment decisions. As such, reducing risk early in development is critical to positioning these projects for the best chances of success in typically what are low return businesses. In this session, we discuss the characteristics of early commitment businesses and the necessary changes to the project development process to reduce risk and facilitate well-informed commitments earlier. We also share leveraging strategies companies can introduce at the corporate level to streamline development of early commitment opportunities.

INDUSTRY TRENDS: Carbon Competitiveness and Low Carbon Scope Selection Understanding carbon competitiveness has become an important decision factor in opportunity selection and project development. IPA has evaluated the carbon competitiveness of numerous E&P projects over the last couple of years. In this session, we present industry trends in project-level greenhouse gas (GHG) emissions performance and emerging practices that influence this outcome. Finally, we highlight the key drivers of low-carbon performance and provide quantitative insights into how certain decisions and scope choices influence carbon competitiveness.

RESEARCH STUDY: Supply Chain Risk to Capital Projects

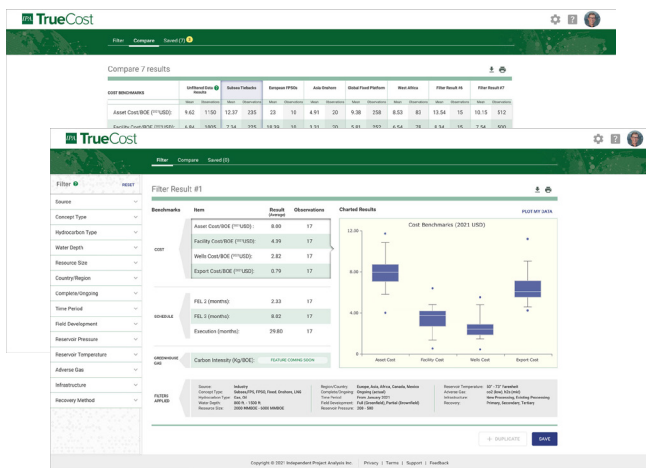
The globalized orientation of supply chains is in a state of flux because of trade wars, COVID-19, and now the invasion of Ukraine. Disruptions to the manufacturing, delivery, and cost of goods, materials, and equipment seem to be the norm and the effect on projects is almost a certainty. Amidst this backdrop, IPA is conducting a detailed study of supply chain risk and resiliency simply because we believe that supply chain disruptions are not a transient phenomenon and further believe that the structure of the global supply chains for goods, in particular, will look different from today. As a result, the assumptions procurement organizations and project teams have made in the past with regard to securing equipment and materials for their capital projects may not be relevant going forward. The focus of this presentation is on understanding risk to capital projects, specifically due their supply chains. We present a hypothesis of a supply chain risk framework and then use this framework to measure project-level supply chain risk at a granular level using projects that IPA has evaluated. We believe this framework can be immediately deployed on projects for project teams to think in more detail about potential risk areas in their supply chains.

To learn more about how your company can become a member of the UIBC, contact IPA Director of Consortia Membership and the IPA Institute Andrew Griffith at agriffith@ipaglobal.com.

TrueCost Opportunity Benchmarking Software

- Use IPA’s project database to quickly identify the right upstream oil and gas opportunities for your company
- Benchmark the value, cost, and schedule of your exploration and production (E&P) opportunities
- Compare your company’s portfolio performance against the industry
- Eliminate the time-consuming process to collect, verify, and normalize industry data from public sources

Contact Shubham Galav at sgalav@ipaglobal.com to request a demo!





BEAM Me Up for Better Projects

By Paul Barshop, Director, Asia-Pacific

Having run several BEAMs recently for clients, the phrase “beam me up” is in my thoughts. The phrase comes from the original Star Trek, a 1960s American television series, and was used when someone asked to teleport back to the Starship Enterprise. The kind of BEAM I do for my IPA clients is a Business Engineering Alignment Meeting. BEAM is a workshop held near the start of FEL 2 at hand-off from the group that led the FEL 1 phase, usually a conceptual study team or strategic planning group, to the team scoping and readying a project for execution.

BEAM Is a Best Practice

IPA research certified BEAM as a Best Practice in 2015, showing that projects using the practice had significantly better cost and schedule predictability than projects that did not. Every project manager should do a BEAM even if their company does not already mandate the practice. Every BEAM I facilitate reminds me of how much value is created with a fairly straightforward exercise.

BEAM Helps Keep Projects From Going in the Wrong Direction

Projects can easily go off in the wrong direction at the start FEL 2, resulting in wasted effort, rework, and enormous frustration for everyone involved when they do.

The wrong direction can reveal itself in many ways. For example, sometimes the project team cannot get the project sponsor to decide on the preferred option because the decision criteria were never made clear. In this case, the

project team may get to the FEL 2 gate with open scope. Open scope in turn results in late changes and adds to estimate uncertainty, making the project less predictable.

Another indication that project went on the wrong direction is when someone on the investment committee at the FEL 2 gate tells the team to “go back and evaluate this option.” The range of options defined at the start of the phase should be comprehensive and have the buy-in of the key stakeholders.

A BEAM maps out the right direction with a clear statement of business goals, critical success factors, and priorities. It establishes the contours of what success looks like so that the team can gather data, firm up options, and do the technical and economic studies to identify the preferred combination of scope and strategy, yielding an economic project with an acceptable risk profile.

Starting in the right direction usually means FEL 2 proceeds as expected. Of course, sometimes there is no scope and strategy that satisfies all objectives. A project still maybe cancelled or recycled, but at least wasted time and resources are minimized.

Here is a good example of starting in the right direction from a BEAM. The project is schedule-driven to meet a critical business need. Sound familiar? At the start of the workshop, the project sponsor explained the business justification for project’s schedule goal. The project manager, who was recently on boarded, had already outlined an acceleration strategy. He described the potential trade-offs and risks of the schedule strategy. The project sponsor understood the risks and agreed to pursue the strategy. Everyone in the room aligned on the objective, understood the work to develop the strategy, and agreed to their responsibilities.

The Project Charter Provides the Basis for a BEAM

Many readers already recognize that the BEAM's content comes from the project charter, a standard FEL 1 gate deliverable for most project delivery systems. The project charter defines objectives, business justification, priorities, givens, assumptions, and boundary conditions. It outlines the base case and alternatives examined in FEL 2.

In theory, a project team taking over could just read the project charter and know what to do. In reality, even a well-developed charter does not capture every nuance of the business case. Besides, nobody reads anymore!

BEAM Starts an Important Dialog

Critically, the BEAM starts a dialog among the project sponsor, key stakeholders, and the project team. The project sponsor explains things like how big the facility should be, what it must produce, how much it should cost, and when it should finish. The team gets clarity on what is more important (e.g., cost or schedule) if the objectives conflict. Stakeholders such as operations provide input on their requirements.

BEAM dialog typically produces at least two or three big "aha" moments. For example, in one BEAM, the participants realized that the project would come online at

nearly the same time as several other unrelated projects. Early attention to operations readiness was noted as an important action item.

BEAM Must-Haves

A BEAM must follow a standardized, repeatable process including preparation, agendas, templates, and required deliverables. It must be facilitated by someone external to the project team. Most importantly, a BEAM is a waste of time if decision-makers do not attend, especially the business function. Little will get resolved and most of the workshop's action items will include "ask the project sponsor."

A Broken BEAM Is Better Than None

Before closing, I want to circle back to the point that the project's charter is the source of the BEAM's content. Unfortunately, for many companies, the project charter is not done well, not enough rigor is applied, and assurance at the early gate is not thorough. Even with a weak charter, I would still insist on a BEAM if I were a project manager. BEAM quickly exposes project weaknesses as workshop questions reveal confusion over goals, undefined boundary conditions, or open decisions. The BEAM might be false start—dare I say a broken beam—but there is a much better chance of going in the right direction at the restart.

IPA Announcements



Astor Luft promoted to Regional Director for North America In his new role, Astor is responsible for IPA's operations in North America, which serves clients in the United States, Canada, and Mexico. He is responsible for maintaining IPA's strong relationships with its existing global and local clients in the region and forging new partnerships with owner companies in a variety of industries including oil & gas, chemicals, consumer goods, power, and infrastructure. Astor previously served as the Regional Director of Latin America and has been with IPA since 2008.



Shubham Galav promoted to Deputy Director, PRD Cost Group As Deputy Director, Project Research Division (PRD) for the Cost Group, Shubham is responsible for the continued development of IPA's cost products, advancing cost engineering research, and ensuring continuous improvement of cost normalization infrastructure and tools. Shubham has been with IPA since 2012 and previously held the role of Research Team Lead for the Cost Group.

Case Study: Pulling the Solutions Levers

By Allison Aschman, Director, Capital Solutions

The Problem

As outlined in part one of this case study, IPA was enlisted to help a mid-size global specialties company with unreliable project outcomes. To address this problem, IPA first assessed the company’s current state to diagnose the root of the problem.

In Part 2, we explore the next steps: solution development and implementation. (See **Figure 5**.)

The Next Steps: Solution Development and Implementation

After aligning on the current state, IPA worked with the client to develop solutions and a plan to implement those solutions. Although this sounds easy enough, it is not. We found that multiple areas needed improvement. In addition, while those improvement efforts are underway, current company project work is ongoing. Thus, any improvement effort must balance the company’s current project needs with the identified system improvement work.

The solution development work started with creating a vision of the company’s desired future state. Without a destination, it is not possible to map out the steps needed to get there. The future state description details out the behaviors, practices, and performance aligned with project delivery as a core competency for the company.

IPA then worked with the client to identify the solution levers to reach the future state. These levers range from company-wide communications to building a new centralized project organization to installing process procedures and templates. We grouped the levers into six main categories, as shown in **Figure 6**.

After targeting a future state and outlining the steps to get there comes the hard work of deciding what to do and when. As shown in **Figure 7**, improving a company process takes time. In fact, it can take 5 to 7 years to see the efforts made fully pay off.

Because it is not feasible to implement all the targeted areas of improvement at the same time while completing ongoing work, we narrowed in on the first few levers to “pull” for the biggest impact. We discuss two of these levers.

Stakeholder Management and Communication

The importance of this lever cannot be understated: it is critical for all the other levers to work. Without understanding and buy-in from key stakeholders, the improvement effort will fail. The scope of this lever includes a workshop with the client to identify stakeholder management and communication needs, including:

- Key stakeholders and their potential influence on this effort
- Target audiences for the identified key messages across the entire organization
- How the key messages will be delivered, how often, and what supporting materials are required
- What information is needed from outside the capital projects group

We Provide End to End Support Based on Change Management Principles

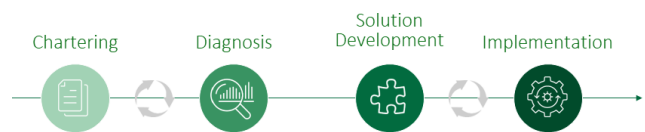


Figure 5

Transformation Levers to Achieve the Future State



Figure 6

Project System Implementation Progress

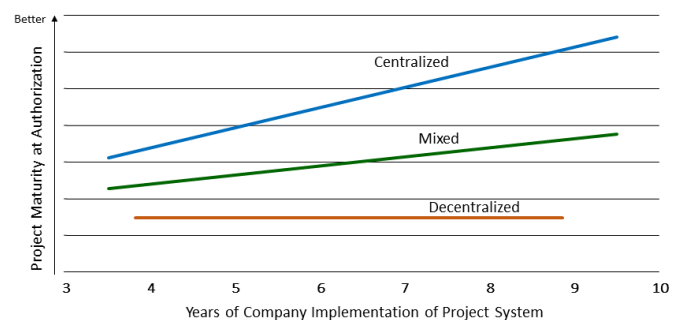


Figure 7

The results are documented in a transformation stakeholder management and communication plan that leverages the design, planning, and implementation work contained in other levers and IPA's project systems research and experience of transformation efforts with other companies.

The communication lever support efforts in implementing other levers, including positioning of capital projects, successfully deploying the sponsor role, and governance. While these efforts are being implemented, it is important to be able to measure progress toward that future state. Managing expectations is key to this effort and communication across the company is needed to do this.

Developing Strategic Project Resources

This lever focuses on deploying company resources to run projects where they add the most value. It includes selecting the resources with the right skills at the right location for the right project drivers or scope. This lever includes not only hiring new resources to fill the needed slots but also developing roles and responsibilities (R&Rs) for the new and existing resources.

While working to implement the vision of the new organization, the immediate needs of strategic projects can be addressed.

Workshops using IPA's project risk and readiness frameworks that assess clarity of objectives, team development, Front-End Loading, controls, etc. provide an objective view of each strategic project's current state to:

- Gain alignment with the project leadership on their project's status and risks, and make practical recommendations for the way the projects are managed in current or future project phases to reduce risk and improve the chance of project success
- Describe the range of IPA support opportunities (reviews, workshops, tools) that we think would be most beneficial through the project lifecycle, and explain the value of these to the project
- Develop a tailored action plan for support to each project

These workshops provide value in their own right because they provide an opportunity for the project leaders to take advantage of IPA's deep knowledge of project risks, measures of readiness, and industry Best Practices to explore how these can be applied practically in their projects.

A secondary objective of this effort is to leverage this support to individual projects to further develop and improve

the company's project system, converting project-specific content into generally applicable system content where possible. For example, BEAM workshops will improve clarity of objectives and trade-offs for these particular projects—critical for project success—but will also help demonstrate the target roles and behaviors from sponsors and other stakeholders that we seek to develop across the project portfolio under other transformation levers.

Achieving the Targeted Future State

Progress toward the company's desired future state is an ongoing effort. As noted, it takes a substantial amount of time to reach this goal. The levers developed and sequenced allow the company to make forward progress while continuing its day-to-day business.



IPA Capital Solutions

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Capital project systems are different from normal business operations. Effective capital project solutions require a deep understanding of how projects work. IPA Capital Solutions' knowledge is based on 30 years of research, benchmarking, and consulting for industrial projects. Our sole focus is on project systems and helping our clients to define and implement the changes needed to make their project systems successful.

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Upgrade your investment decision-making process

Contact Us

Allison Aschman at aaschman@ipaglobal.com

Deb McNeil at dmcneil@ipaglobal.com

IPA Events and Presentations

Carbon Working Group

January 24, 2023

Virtual Meeting

Launched in 2020, the CWG is an IPA-led group of 35+ owner firms working together to develop tools and frameworks to benchmark and improve the low-carbon performance. The scope of work addresses performance of project systems and individual projects. Member companies come from all industrial sectors. The group is actively progressing multiple environmental sustainability topics such as carbon competitiveness of projects, electrification of assets/sites, low-carbon scope selection, CCS, supply chain emissions benchmarking, and more. Contact Adi Akheramka at aakheramka@ipaglobal.com for more info on how to become a member of the CWG.

ECC Extra Conference

February 16, 2023

New Orleans, LA

IPA COO Elizabeth Sanborn and Site & Sustaining Capital Manager Katherine Marusin will discuss Inspiring Success in Capital Projects. Elizabeth and Katherine will use IPA insights to provide analysis of Gulf Coast capital project trends, insights, and tangible takeaways to inspire attendees to drive successful outcomes in future projects. Visit www.ecc-conference.org for more information.

Industry Benchmarking Consortium (IBC)

March 20 to 22, 2023

Lansdowne, VA

Established in 1992, the IBC is a premier group of the world's leading industrial companies in the processing, refining, infrastructure, and mining and minerals sectors. 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 outcomes stack up against their industry peers with respect to safety, cost, schedule, and operational performance. IBC member companies actively discuss the latest capital project industry trends and performance hurdles at the annual meeting, as well as through competency-focused subcommittees, communities of practice, and periodic webinars. Contact Andrew Griffith at agriffith@ipaglobal.com for more information.

Upstream Cost Engineering Committee (UCEC)

June 2023

Details to Be Announced

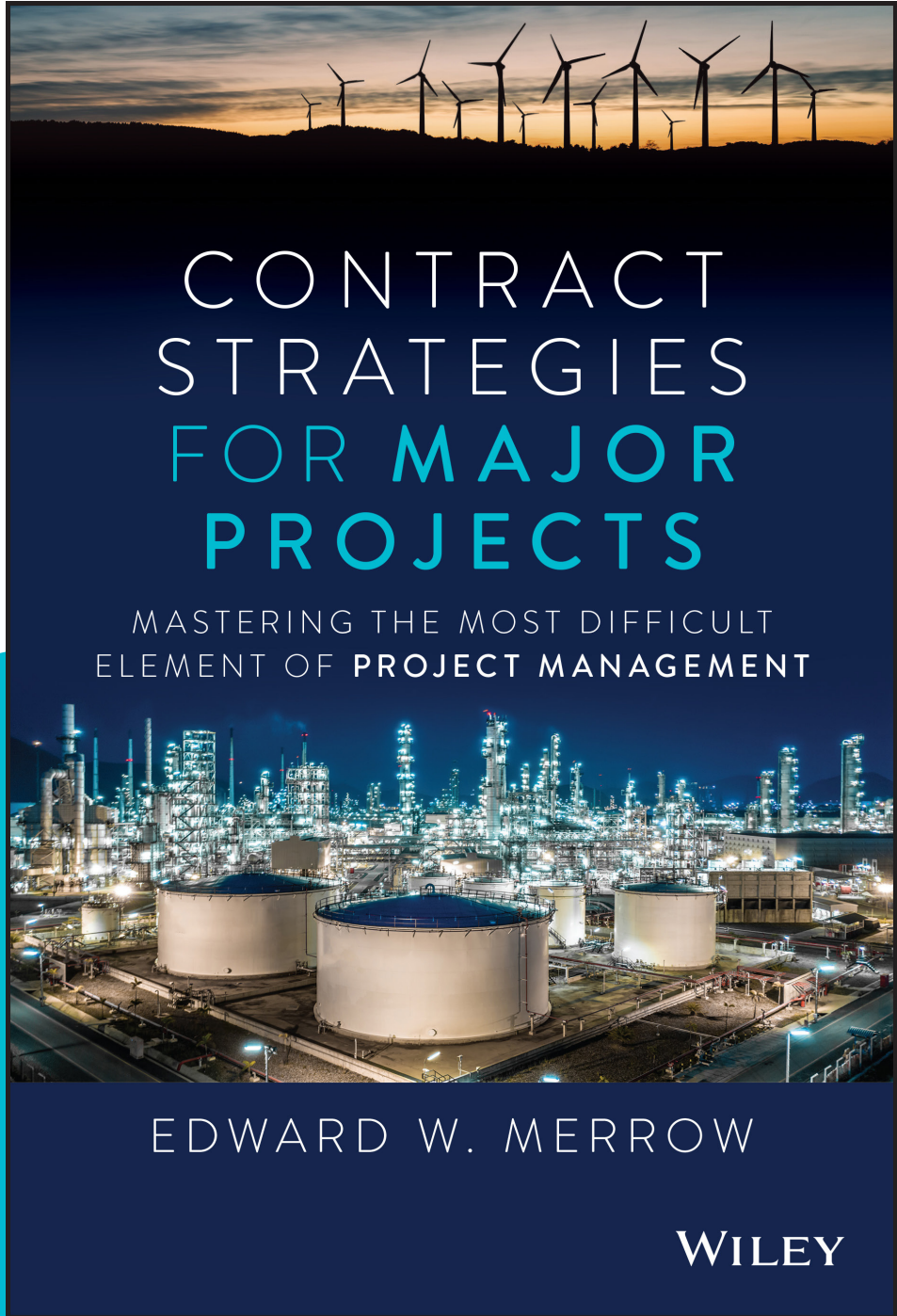
The UCEC strives to improve upstream project and business results by providing metrics for better cost engineering. Member company representatives gather once a year to learn about and review new UCEC metrics packages prepared by IPA. The upstream metrics packages are used by companies to compare their 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.

IPA Institute Announces Virtual Training Course Schedule for Early 2023

Courses	Dates	Times	Language	Fee	Click to Register
Project Management Best Practices*	January 9–13	9 a.m. to 12 p.m. (U.S. Eastern Time)	English	\$1,200 USD	REGISTER
Front-End Loading and the Stage-Gated Process	January 24 & 25	9 a.m. to 11 a.m. (U.S. Eastern Time)	English	\$400 USD	REGISTER
Capital Project Execution Excellence and Project Controls	February 14 & 15	9 a.m. to 11 a.m. (U.S. Eastern Time)	English	\$400 USD	REGISTER
Project Stakeholder Alignment Through Successful BEAM Implementation	February 22	9 a.m. to 12 p.m. (U.S. Eastern Time)	English	\$300 USD	REGISTER
Gatekeeping for Capital Project Governance	February 28– March 2	9 a.m. to 11 a.m. (U.S. Eastern Time)	English	\$600 USD	REGISTER
Project Management Best Practices*	March 6–10	9 a.m. to 12 p.m. (U.S. Eastern Time)	English	\$1,200 USD	REGISTER
Front-End Loading and the Stage-Gated Process	March 14 & 16	10 a.m. to 12 p.m. (E. South America Time)	Spanish	\$300 USD	REGISTER
Front-End Loading and the Stage-Gated Process	March 21 & 23	10 a.m. to 12 p.m. (Brasilia Time)	Portuguese	\$300 USD	REGISTER
Front-End Loading and the Stage-Gated Process	April 4 & 5	9 a.m. to 11 a.m. (U.S. Eastern Time)	English	\$400 USD	REGISTER
Best Practices for Site-Based Projects*	April 10–14	9 a.m. to 12 p.m. (U.S. Eastern Time)	English	\$1,200 USD	REGISTER
Project Stakeholder Alignment Through Successful BEAM Implementation	April 19	10 a.m. to 1 p.m. (Pacific South America Time)	Spanish	\$300 USD	REGISTER
Megaprojects: Concepts, Strategies, and Practices for Success*	April 24–28	8 a.m. to 12 p.m. (U.S. Eastern Time)	English	\$1,800 USD	REGISTER

* **Group Discount Available:** Register 3 and send a 4th for free!

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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