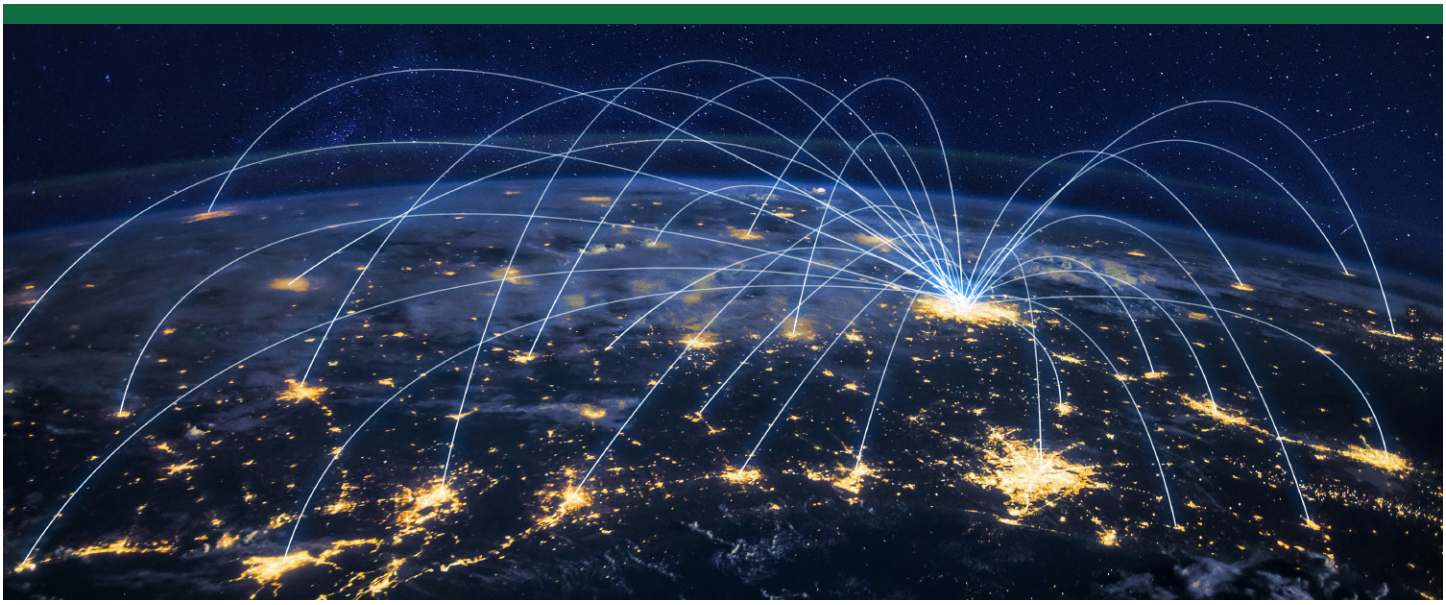
Independent Project Analysis, Inc. | Volume 13, Issue 1 | March 2021

# IPA Newsletter



## Supply Chain and Capital Efficiency Gains

**By Carlos Tapia, IPA Director, Integrated Energy Practice**

In the last decade, the oil and gas industry has been forced to confront enormous headwinds brought about by global commodity pricing crises; strong societal forces in favor of decarbonization; and now, of course, the COVID-19 pandemic's effects on global markets. While greening seems to be the obvious (and most popular) answer, in the short or medium term, oil and gas owner companies cannot walk away from traditional revenue-generating assets. A critical challenge these companies therefore face is an old one—how can they produce their traditional product more cost efficiently and move to lower breakevens? This is an urgent issue that requires innovative solutions, lest companies resign themselves to their own demise.

The typical playbook of how oil companies would react to past crises included downsizing and constraining capital outflows. Budget tightening invariably involved squeezing gains out of the project supply chain, many times with no regard for the survival of the vendors' market. This strategy is not only short-sighted because of permanent destruction of suppliers' skill and capabilities but also short-lived: time and time again, once prices recovered, vendor discounts would evaporate.

Following the 2014 oil price downturn, and recognizing the limited space for squeezing costs down further without a sustainable strategic vision, key industry players actively started searching for lasting capital efficiency breakthroughs—new ideas that could sustainably reduce project costs and/or durations. It is in this context that these corporations have been exploring opportunities to reduce third-party spend,[1] where 70 to 80 percent of the facilities capital project investment goes. The additional blast of

[1] Third-party spend includes all non-owner CAPEX cost categories, e.g., detailed engineering, fabrication, installation, etc.

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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.

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collapsing prices under the pandemic and the now ubiquitous question of economic viability of assets has made exploring these opportunities even more attractive.

An Independent Project Analysis (IPA) study conducted in 2018 with the participation of four major oil and gas companies focused on practices that could provide significant productivity and capital efficiency improvements that are symbiotic for suppliers and operators. The study assessed deepwater facilities competitiveness of two primary scope elements—floating productions units (FPUs) and subsea system—and found that most opportunities are borne out of the long-known benefits of standardization, repeat supply chain, and simplification of design. This was not surprising: for several years, IPA has been studying these practices and measuring their significant contribution to capital gains. What was revealing is how much the combined use of these practices moves the needle in terms of achieving sustainable savings. In addition, the study shed light on how limited industry operators' approach has been to systematic implementation of the practices, and the study further helped identify the corporate-wide enablers paramount to making the gains permanent rather than fleeting.

Facilities Standardization—both in FPUs and with subsea assets—offers capital cost savings of about 15 percent compared to a customized design. However, the combined application of a standardized solution along with repeat use of the supply chain offers significant additional gains. Average savings on the order of 25 to 30 percent can be achieved when design standardization is conceived and executed with the same supply chain approach over the life of a program in which the owner team and suppliers (engineering firm, subsea vendors, substructure vendor/yard, topsides fabricator, integrator) remain unchanged. An earlier IPA study revealed that even using a repeat supply chain for non-standard facility concepts can provide large cost gains.[2]

Repeated use of design is not a new idea. It has been applied in the industry for a long time; however, with the exception of a couple of operators, it has not been done in a systematic manner in the offshore industry and, more specifically, in deepwater where capital investment becomes more

Standardization and Spec Simplification Are Distinct but Overlapping Dimensions

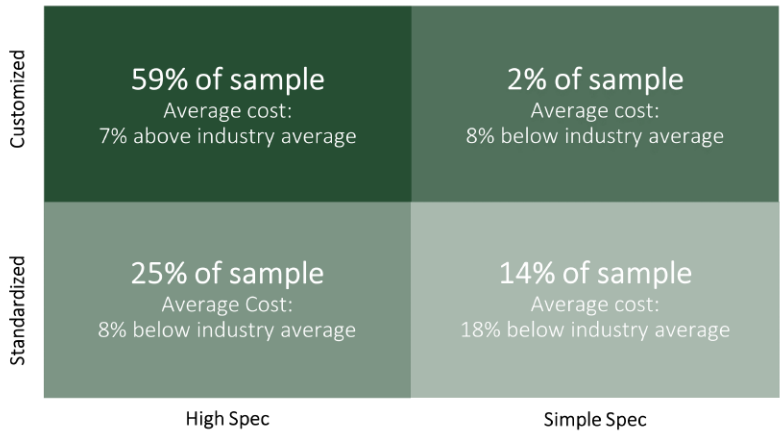



**Figure 1**

[2] Edward W. Merrow and Jason Walker, *The Efficacy of Unusual Contracting Approaches*, UIBC 2018, IPA, November 2018.

intensive. While there are examples of standardization for programs of projects, no wide-ranging industry approach has been undertaken at the overall portfolio level until recently, as showcased by the operators participating in the study. If the extended E&P industry aims at institutionalizing standardization, both technical and supply chain, the opportunity and challenge lies in extending the approach to global portfolios.

Simplification of technical specifications is another area of opportunity. The magnitude of this effect will become clearer in the next few years as more projects come online, but with the available data, we could expect an average 10 percent gain. This finding is significant, and it is the first time our data have allowed differentiation of the effect of standardization from simplified specs. The two practices are distinct, with independent positive effects on the projects, but have overlapping dimensions. We observe cases of standardized kit that is not simplified and vice versa, along with cases of both standardized and simplified specs. The biggest cost savings may yield a delta of about 25 percent between a standardized + simple spec facility and one that follows a traditional customized approach with high spec requirements.[3]

Simplification of specs should not be considered a one-time initiative. The longer-term goal of wider owner acceptance of a common set of specifications is key to enabling the conditions where vendors can invest in developing cost saving standardized technology.

The participants in the study shared was that, in the long run, real savings will come from vendor-led cost saving innovations. This is an interesting view coming from owner representatives: historically, owner companies in the oil and gas industry have been known to be quite protective of the provenance of their technical know-how because of the perceived competitive advantage it may provide. This has led to behaviors that preclude third-party innovation efforts, facilities over-design and, therefore, costly assets. Standardized vendor-led solutions are critical to low margin industries. The absence of these in oil and gas, with the exception of a couple of operators, hurts competitiveness and needs to be remedied if the offshore industry is to succeed as a low margin business. Our work with the commodity chemicals sector further bears this out—the advantaged companies are those that can continue to improve their margins by lowering their cost of projects. It also requires reducing the complexity of their projects. Chemical firms, for example, that could not simplify their projects and continued to focus on complex custom specs and designs are no longer around.

Together with efforts to establish a supply chain based on standard and simplified designs, Industry has pushed, more prominently in subsea, to deepen supplier relationships—that is, to focus on fewer suppliers but with an emphasis on deepening collaboration with that core group. This trend was aided by market consolidation, but it also seems to recognize the success that many companies have experienced by leveraging long-standing collaborative relationships both in subsea and production platforms.

In much of the project data we gathered, getting vendor input early, before scope decisions are landed, has led to deeper supplier relationships through the repeat use of contractors and the supply chain, which is widely viewed as a positive. Because these practices are used simultaneously, the independent effects cannot be isolated at this time. We, therefore, attribute savings associated with maintaining deep supplier relationships through repeat use of the supply chain as a combined benefit with early contractor engagement. Note: some owners raised several downsides associated with this approach, one of which is that early commitment to a vendor puts negotiating leverage at risk and may hurt competitiveness, but we have seen this countered in several ways.

### System Organization and Leadership as Key Enablers (or Barriers) of SCM-Related Practices

Although many organizations had partially standardized their subsea kits prior to 2014, the practice was not uniformly embraced. In part, this happened because of organizational barriers. Many past standardization initiatives failed in the face of resistance from technical leads; after all, engineers are in the business of engineering solutions. Simplification of specs is challenged in a similar manner. For years, the E&P industry took a laissez-faire approach to design robustness. Technical teams focused narrowly on ensuring high quality and integrity of the engineered assets, which, admittedly, is aligned with their mission. However, unless you are an engineering firm, facilities design and construction is a means to an end, not the objective. In this context, the businesses holding the capital purse need to test and challenge whether the quality of the design delivered by their technical teams (aided by the engineering contractors) is excessive for the actual needs of the business case. Not doing so may lead to designs that are too heavy or robust for their purpose. Systematic overdesign results in gold-plated installations that are expensive to build and expensive to maintain. The erosion of capital value becomes huge and permanent.

[3] This analysis combines both FPUs and subsea systems; however, our data on where simplified specs have been employed is predominantly in subsea systems.

Another common barrier is organizational structure. Where project teams have greater autonomy and authority, standardization is disadvantaged because individual developments can more readily demonstrate how technical customizations yield optimal solutions. The benefits of standardization accrue more to the system than the individual development, but, in the absence of a strong centralized group making this case and enforcing discipline, it is easier for project teams to deviate. Keeping centralized functional groups, such as procurement, enables savings while affording relatively strong and integrated project teams. The centralized procurement function is positioned to assess opportunities across the portfolio (e.g., to bundle and negotiate scope across projects) while assigning resources to project teams. In addition to procurement, a systemic approach to standardization, rather than customization, requires alignment and commitment of other key functions of asset development like reservoir, drilling, and commercial.

The other key enabling condition is leadership. The organizations that responded most quickly and effectively to the market downturn benefited from clear top-down leadership on how the organization and its approach to projects would change. These organizations made rapid progress in evaluating new initiatives, reaching conclusions on which strategies the organization would adopt, and pushing those strategies across the organization. This kind of transformational change requires a structured change management approach mandated from the top and organized with organization-wide participation of all key functions. IPA's SPM research has been an instrumental component of the needs assessment process that identifies opportunities to reap the benefits of effective supply chain management.

**Conclusions**

Global oil and gas industry operators are being confronted with a stark scenario of diminished market prices and strong societal forces in favor of non-fossil derived fuels. Companies are being forced to reinvent their business model in what may turn them, if successful, into fully integrated energy companies. In this new model, fossil fuel assets will become increasingly less important, but their prominence as a primary source of energy will not fade away too abruptly. For several years to come, oil and gas operators will continue to pursue market opportunities for their fossil fuel assets albeit in much more stressed circumstances.

In their quest for improved capital gains, four major oil and gas operators have been exploring diverse project supply chain-related practices showing standardization, repeat use of the supply chain, and simplification of technical specifications are important areas to understand and exploit. These approaches were aided by early engagement of key suppliers and contractors, an essential element for these practices to work. IPA has quantified the capital gains, and they are staggering: they may range between 15 to 40 percent of third-party spend depending on how many of the identified practices are used on a particular project. For the practices to become embedded in an organization and provide sustaining benefits, a corporate change management approach is required. The challenge is not trivial because long-standing organizational and cultural barriers within the companies' structures need to be broken and redefined.

**Contact Carlos Tapia at ctapia@ipaglobal.com** for more details on IPA's research and Capital Solutions opportunities in Supply Chain Management.

## IPA Names Carlos M. Tapia as Its New Integrated Energy Practice Leader

In his new role, Carlos Tapia will engage with global energy business leaders navigating the evolving energy landscape, providing them with facts, data analytics, and research-based advice to deliver sustainable returns to shareholders. He will also steer IPA's energy transformation initiative, helping integrated energy companies, nationally owned oil operators, and independents deliver competitive new business opportunities including lower carbon technologies; carbon capture, utilization, and storage (CCUS); renewables; and other alternative energy opportunities.

He succeeds Neeraj Nandurdikar, who departed IPA in January 2021 after 21 years of service. IPA wishes Nandurdikar continued success in his future.

**Carlos M. Tapia**
Integrated Energy Practice Leader

# Carbon Competitiveness Toolkit Now Available for Use by Upstream Oil & Gas Project Teams

Developed from IPA's carbon management research, the **Carbon Competitiveness Toolkit** directly compares your project's data to industry benchmarks, and delivers actionable carbon reduction insights and analytics. The toolkit is comprised of four products that help business leaders and project teams strike the right balance between lower carbon intensity and project costs:

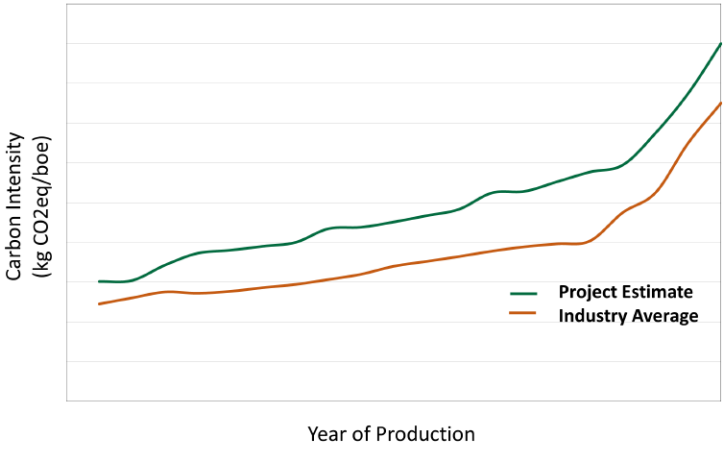
- Carbon Intensity Benchmarking

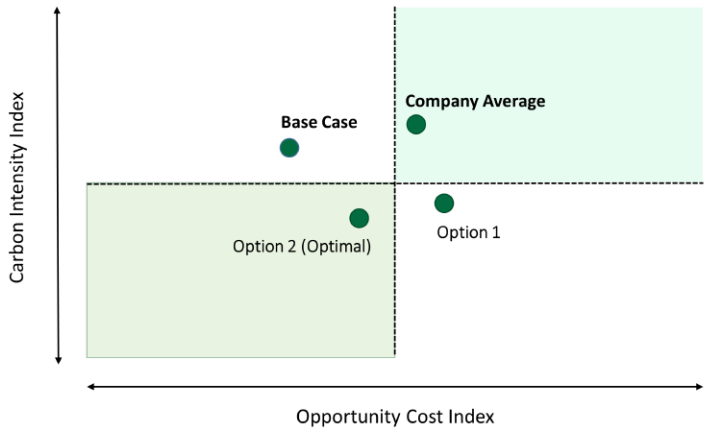
- Carbon Capital Effectiveness

- GHG Estimate Maturity Index

- Carbon Readiness Assessment

**Contact IPA Advanced Associate Research Analyst Adi Akheramka at aakheramka@ipaglobal.com for more information.**



# Shaping CCUS Opportunities Requires Diligence

**By Tim Jeanneret, IPA Project Analyst**

Carbon capture, utilization, and storage (CCUS) is emerging from the shadows after years of promise but little investment. Capital spending on CCUS technology is recognized as critical to achieving net zero emissions goals. Significantly, companies that had been sitting on the fence now have CCUS firmly in their business strategies and are preparing to invest billions: new CCUS capacity in development has more than tripled in the last 3 years and is expected to deliver twice the capacity of the 26 facilities already in commercial operation globally.[4] These projects must pave the way for many more: the International Energy Agency's Sustainable Development Scenario has the amount of $CO_2$ captured growing by a factor of 20 in the next 10 years.[5] A bold target, indeed, if we aim to achieve it.

Many corporate leaders, recognizing the strategic need for CCUS technologies, now face this challenge: will our proven capital project development and execution model also deliver success for novel CCUS projects in an unfamiliar context? In completing project risk evaluations of half of the currently operating large-scale CCUS projects, Independent Project Analysis, Inc. (IPA) has found wide differences in the use of known Best Practices—and in cost and schedule outcomes. This article is the second in a series introducing the key factors that drive success in CCUS projects, based on learnings from these evaluations and other projects with similar complexity. The first article covered the need for clear business objectives. This article focuses on how we shape an opportunity to enable these business objectives to be developed into an executable project. We will identify particular shaping complexities that CCUS projects face and answer this central question: Does the imperative to deliver CCUS projects justify a different approach to opportunity shaping than the established Best Practice for megaprojects?

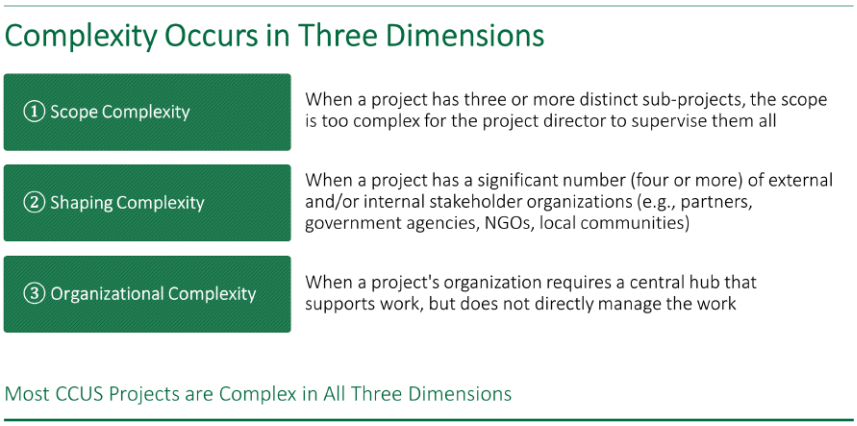



**Figure 2**

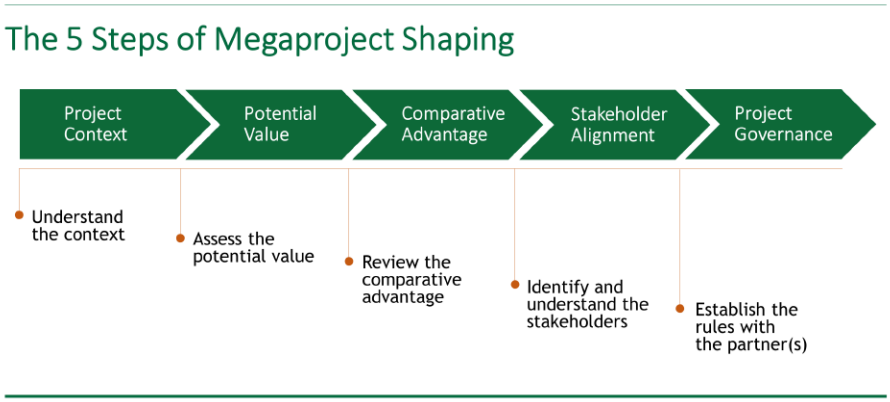



**Figure 3**

### Opportunity Shaping Challenges for Integrated CCUS

The first article in this series, advocating clarity in business objectives for CCUS projects, explained how the multiple technical and organizational interfaces common in integrated CCUS projects, and an often untested and fluid regulatory and financial environment, give these projects a shaping complexity that can put them in megaproject territory—even when the capital cost is relatively modest (Figure 2). Note that this complexity is rarely technical. The shaping challenges reviewed in this article consider breadth of scope and, in particular, the novelty of the business proposition: capturing $CO_2$ from anthropogenic sources, transporting



[4] Global CCS Institute, *The Global Status of CCS: 2020*, November 2020. https://www.globalccsinstitute.com/resources/global-status-report/
[5] International Energy Agency, *CCUS in Clean Energy Transition*, PDF, September 2020. https://www.iea.org/reports/ccus-in-clean-energy-transisitions

it, and storing it permanently underground, often within a wholly unfamiliar commercial model.

What do we already know about megaproject shaping? As IPA Founder and President Edward W. Merrow explains in his seminal book, *Industrial Megaprojects*, good megaprojects start with a business-led process that allocates project value among the stakeholders to fashion a project environment stable enough for successful execution while meeting the sponsor's objectives. This process of evaluating key project attributes, gathering the information needed for key decisions, and allocating project value is what we call shaping. Shaping can be conceptualized in five key steps, illustrated in Figure 3. These steps must be completed by the end of the scope development phase (FEL 2) of our project process if later phases are to have a strong chance of success.

The following CCUS project characteristics pose particular challenges as we follow this shaping framework.

**Regulations Are Fluid:** An important objective of understanding the project context is mapping the regulatory landscape and assessing its stability. Merrow's research found that permitting problems, such as when permits are delayed or withheld, or when permitting requirements change repeatedly, are encountered by 20 percent of megaprojects. Permitting problems cause these projects to really suffer: they had double the average execution schedule slip, four times higher cost overruns, and more prevalent operability problems when compared to the 80 percent that avoided permitting problems.[6] If a primary purpose of shaping is to calm the turbulent environment enough for smooth execution without serious damage from that environment, the shaping process for these 20 percent of projects can be said to have failed fundamentally.

But regulations covering CCUS—including transportation, injection, and long-term storage liability—are in transition in many jurisdictions; in others, laws have been passed but are yet to be tested. Some CCUS projects may have as an explicit objective to demonstrate a navigable path through new national and international regulations, reducing the risk for investments that follow. In these cases, a deep practical understanding of the regulatory climate, and the clearance of permitting hurdles, are not just enablers of smooth execution—they are outcomes to be valued in themselves by the project sponsor. Pioneering CCUS sponsors may need to take regulatory shaping further yet by identifying where necessary regulation is missing or outdated, and through their advocacy and expertise lead efforts to drive forward new laws, enabling their project and others to move ahead.[7]

Accordingly, whereas in more conventional projects the influence of permitting on the critical path may be the project director's sole interest, for CCUS projects, regulatory issues have a broader significance and call for a tailored approach.

First, we must start understanding the regulatory constraints from the start of shaping a CCUS opportunity but nonetheless accept that regulatory uncertainty may remain later in project definition, and even execution, than we would normally accept. This demands rigorous assessment of regulatory risk and clear alignment with project and CCUS-chain partners, investors, and internal stakeholders on how that risk will be treated at key project decision points. Secondly, the significance of regulatory activities to achieving business objectives must be clearly expressed to ensure the necessary resources are available to the project and to ensure decision makers' tolerance of regulatory risk reflects that significance. Finally, instigating regulatory change will likely need to be started long before it is required and will require owners to organize their efforts from the top of the company down and from the project team up. These challenges will almost always justify the inclusion of a dedicated permitting and regulatory affairs representative on the project team.

**Potential Value Is Unproven:** In most jurisdictions, the price of emitting $CO_2$ is still lower than the cost of capture, transportation, and storage. CCUS schemes, therefore, usually rely on national or transnational subsidies or other financial incentives to demonstrate a viable business case. (Although some CCUS projects to extend the life of a carbon-intensive facility that would otherwise be a stranded asset may be fully justified by the continued income from that facility.) Government incentives are subject to change as administrations seek mechanisms to deliver evolving climate policy and, as a result, CCUS business case shaping must often make considerable assumptions about carbon pricing over the life of the facility.

Additionally, some CCUS projects—most obviously hub and cluster concepts—aim not simply to create capital assets that will deliver a return but also to create an entirely new business. This adds further uncertainty to the early business

[6] Edward W. Merrow, *Industrial Megaprojects: Concepts, Strategies, and Practices for Success,* Hoboken: John Wiley & Sons, Inc. April 2011.
[7] For example, an amendment to the International London Protocol, enabling transboundary movement of $CO_2$ for storage, was eventually adopted in 2019 following advocacy by the Dutch and Norwegian governments on behalf of particular CCUS projects.

case. Establishing the feasibility of such ventures can be challenging for industry decision makers, who are used to having high confidence in the value of a conventional sub-surface resource to be exploited and an established market to be served. A CCUS project aiming to create a new business may not be able to follow our normal decision making frameworks, which require business case closure before starting FEED. When planning CCUS opportunity shaping, we should recognize when business development and scope development must mature in parallel, up to and even beyond a final investment decision (FID).

This has implications for the way we approach our assessment of the potential value of such projects. If we measure success by the influence a project has on future CCUS development, as well as the intrinsic value returned by the project, then we must ensure that definition of value is recognized by internal business stakeholders. This value model will likely be more complex and harder to quantify than IRR alone and rely on measures of application, diffusion, and information success, and traditional measures such as the CAPEX and operability performance of an asset. Getting our value model right will ensure we focus our shaping efforts throughout FEL on meeting the true strategic business needs.

This will also likely mean more business and commercial development functions within an integrated CCUS project team than we would expect based on the scale and complexity of the technical scope, and we should accept that staffing costs for opportunity shaping and business development throughout FEL will be correspondingly higher.

**Stakeholder Engagement Is Critical:** CCUS projects come with many stakeholders and potentially significant external interest. These stakeholders may operate outside the owner company's usual range of influence and expertise. However, they can be critical to a project's success. External stakeholder relationship-building and broader public relations efforts must go hand in hand with the regulatory and business development shaping activities discussed.

This can involve a considerable workload for a team shaping a CCUS project. IPA interviewed one CCUS project team in a critical development phase that found itself giving an average of two external presentations per day. It goes without saying that few owner teams, even for megaprojects, are set up to coordinate this level of stakeholder attention and keep stakeholder claims on project value sufficiently aligned with the project sponsor's interests.

CCUS projects also tend to involve several partners or stakeholders within the CCUS chain, with potentially conflicting agendas that cannot be assumed to be aligned. Examples include emitters looking to install CO2 capture at minimum cost, transportation providers trying to maximize infrastructure utilization and expand service provision, operators keen to repurpose legacy production assets for CO2 injection rather than bear disposal costs, and storage liability holders obliged to limit long-term risk. All of these stakeholders must be brought onboard with coherent aims for the project, and the timing of their commitment to the project must be carefully coordinated to allow progress.

If we accept that regulatory and business case uncertainty may extend beyond completion of scope definition, we should nevertheless contemplate no such delay with stakeholder management. Stakeholder engagement should be actively pursued with adequate resourcing in the owner team from the start of shaping. It should not wait until scope definition is underway.

**Project Governance Must Not Be Neglected:** Establishing the governance rules with project partners is another shaping task that should not be allowed to drift into late FEL (although IPA sees this often). If a CCUS project will be executed through a joint venture (JV), it is tempting for the partners to delay agreeing to the framework for JV operation until the rest of the opportunity is fully shaped. This is a mistake. IPA research into the drivers of success for JV projects identified important practices that improve cost and/or schedule performance. These include, for example, completing the JV agreement before FEL 2 and agreeing on a process for managing interfaces among partners and with the project team.[8]

Without differences in CCUS project partner aims being aired and resolved in a JV agreement, business objectives and trade-offs cannot be clearly and reliably defined. The dependence on potential non-JV CCUS chain members, regulators, and other external stakeholders will likely add enough complexity to the project development and approvals processes: there is no sense in making these processes even more difficult by not having governance rules agreed between the partners and in place beforehand. Uncertainty in JV structure and governance can also make the task of planning execution and operation unnecessarily trying.

### Conclusions

Let us return then to our question: Does the imperative to deliver CCUS projects justify a different approach to

opportunity shaping than the established Best Practice for megaprojects? The answer is a qualified Yes. The need to forge ahead in some cases in a changing regulatory context and with an unproven business case does challenge our application of shaping Best Practice. A CCUS project may not be able to close these issues in in the project's scoping phase. We should recognize this increases the risk of instability during project definition and requires application of rigorous what if scenario planning to help maintain progress and reduce disruption if plans or project parameters need to change.

The size and organization of the CCUS Project team is critical to success. The team requires additional and dedicated resources to manage these riskier areas of shaping, and assigning clear responsibility for ongoing shaping must be done early in the project development. These resources should be integrated under the Project Director to avoid misalignment of business development and scope development workstreams.

Acceptance of greater risk in some areas of shaping is no excuse for needlessly increasing risk by neglecting others. In particular, stakeholder alignment and project governance must be addressed early and rigorously.

Finally, we have learned that, by necessity, some aspects of the CCUS project environment are less stable than we would like, increasing the risk of scope and design changes late in FEL and into execution. However, we must not compound that risk by authorizing projects with incomplete project scope definition or weak execution planning. Opportunity shaping may bring unique and exciting challenges early in CCUS projects, but we must not lose sight of the fundamental imperative to deliver assets that operate safely and at full design capacity, on time and within budget, and to guarantee these we should also apply all we already know about project Best Practices in FEL and execution.

The third in this series of CCUS articles will share learnings from similar technology scale-up challenges. **To learn more about how IPA can improve the predictability and competitiveness of your company's CCUS project, please contact Adi Akheramka at aakheramka@ipaglobal.com.**

[8] Phyllis Kulkarni and Kelli Ratliff, *Best Practices for Joint Ventures*, IBC 2004, IPA, March 2004.

# Restarting Capital Projects Successfully After the COVID-19 Lockdown

**By Ronell Auld, IPA Advanced Associate Project Analyst**

Planning for capital projects has picked up after the introduction and rollout of COVID-19 vaccines in 2021. During the past year, Independent Project Analysis (IPA) has regularly surveyed our clients—the global leaders in the energy, chemicals, consumer products, and other processing sectors—to quantify how they are navigating their businesses and capital projects through the pandemic. According to these IPA surveys, companies slowed, stopped, and canceled project work across their portfolios, reducing capital spend by 34 percent, on average, during 2020. Now, in 2021, companies are in search of successful strategies for restarting projects as the world enters the vaccination and post lockdown stage of the pandemic.

Over the years, IPA has been at the forefront of investigating Best Practices for stopping and restarting capital projects. In 2020, we published research and provided special studies to help our clients manage the unprecedented market uncertainty and lockdowns occurring in the early stages of the COVID-19 pandemic. Today, we continue our mission to improve our clients' capital effectiveness by conducting quantitative analyses of the myriad risks and different Best Practices for restarting capital projects after an unplanned stoppage.

While the market disruptions caused by the COVID-19 pandemic are unparalleled in recent history, unexpected and protracted project stoppages are not without precedent. In the wake of the 2008 Global Financial Crisis, IPA observed a number of projects that stopped and restarted, with an average stoppage period of 13 months. In recent years, natural disasters, including hurricanes making landfall along the U.S. Gulf Coast and large wildfires across North America and Australia, forced owners to stop projects in their tracks and map out plans to get them going again.

IPA has reviewed over 200 capital projects stopped due to a force majeure or major market event that later restarted and completed project work. These comparison projects range in size from $17 million to over $5 billion and were located in the United States, Europe, and Asia. The projects are representative of a diverse set of industrial sectors, including refining, chemicals, and mining. Both cost- and schedule-driven projects are represented, as are greenfield and brownfield projects.

### Difficult Project Restart Decisions Lie Ahead

As more of the world population is vaccinated and transitions out of lockdown, business leaders face increasing pressure to deliver projects that strengthen

their company's market position and competitiveness. Capital managers and project sponsors must align on the value proposition for each project in the portfolio, balancing risks associated with the remaining execution against their forecast revenues, or other business justification for the project. Business has to manage cost-benefit risk by deciding which projects to cancel and which projects to restart. The next important decision after that is selecting the best restart strategy for each project to deliver business value.

Owner companies should be aware of the different risk profiles when restarting their capital projects. IPA research shows that outcomes differ considerably depending on the project lifecycle phase in which the stoppage occurs. Projects stopped and restarted during the definition phase of the work process, before detailed engineering and construction, had similar outcomes to projects that never stopped and restarted. In contrast, projects stopped and restarted after the definition phase averaged about 5 percentage points more cost growth than uninterrupted projects. Moreover, IPA research found that projects stopped and restarted during the construction phase average significantly more cost growth than projects stopped and restarted during detailed engineering. These typical outcomes affect project economics and should be considered during the restart decisions.

IPA research has found that projects with long deferrals have considerably more business risk, averaging lower net present value (NPV) than projects with shorter postponements. Projects with lengthy postponements are more likely to encounter changes in permitting and government regulations that disrupt execution plans, contributing to higher total costs and less predictable construction schedules. There is also risk of losing key owner and contractor team members, along with their valuable execution knowledge. In addition, owners should expect to re-negotiate contracts with material and labor suppliers after a long postponement.

### Do Not Rush Project Restarts

Business and project teams too often overestimate their ability to mobilize and coordinate resources when restarting projects, for example, by not hiring enough safety mangers to keep pace with aggressive field mobilizations during fast construction restarts (Figure 4). IPA research has found that best performers have strong QA/QC programs that support their transition from engineering to construction. The transition from construction to operations is another risk area for projects restarting after postponement. Owners should not overlook startup risks as final operability contributes greatly to a project's NPV. Business and project teams should be aware of how even relatively short postponements can present challenges to smooth start ups.

IPA has the industry data and experience to help project leaders protect the value of their capital investments. Since the onset of the pandemic, we have worked with numerous site managers, business sponsors, and CEOs to develop risk mitigation and scenario planning strategies. We provide capital solutions that are specific to each client and their respective project portfolio(s) to help them succeed in the new economic landscape created by the COVID-19 pandemic.

**Contact Ronell Auld at rauld@ipaglobal.com t**o learn more about the risks and Best Practices for restarting capital projects.

## Projects With Fast Construction Restarts Have Lagging Safety Results on Average


**Figure 4**

# IBC 2021 Goes Virtual, Featuring New Capital Projects Research

New quantitative research studies focused on improving the development and execution of capital projects are set for presentation at the 2021 annual meeting of the Industry Benchmarking Consortium (IBC 2021). Again this year, Independent Project Analysis (IPA), Inc. will host a virtual event exclusive to employees of IBC member companies. This year's IBC theme will focus on the early stages of project definition when business objectives are translated into project scopes.

The first IBC 2021 webinar is set for March 23, with IPA Founder and President Ed Merrow delivering a keynote address on critical issues facing the projects industry as the COVID-19 pandemic tailwinds continue. In addition to webinars featuring new industry research study presentations, the virtual IBC 2021 event includes industrial sector breakout sessions and project performance competitiveness briefings for large and site and sustaining capital projects. The webinar event schedule runs from the end of March through the end of April. Each IBC session is delivered live twice to accommodate all time zones.

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.

**Six new research studies are on deck for IBC 2021:**

**Conceptual Estimating and Scheduling for Business Decision-Making:** Owner companies routinely tell IPA of their struggles with early (conceptual) estimating. These estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. The development of tools to generate more centered estimates for cost and schedule as well as a better characterization of the estimate ranges can empower businesses to make more informed project decisions.

**Getting Gate 1 Deliverables Right:** One of the persistent problems in projects is that the Gate 1 deliverables are not well-formed, leaving holes for the scope development team to fill in with assumptions. This creates the problem called *bring me a rock*, which consumes a lot of time and leads to sub-optimal scopes of work that need to be improved in FEED or even into execution. This study focuses especially on the regulatory context for projects, stakeholder issues, framing of the business case, and adequacy of the Basic Data where that could be an issue.

**Making the *Agile Manifesto* Agile for Heavy Industrial Projects:** A number of IPA clients have started implementing some form of Agile in their project systems. Agile is a well-developed methodology that has been around for

20 years and, though initially intended for the software industry, has helped make positive change across industries. This study is a careful dissection of Agile from the point of view of opportunities and limitations when applied to projects.

**Measuring Engineering Quality:** Delivering engineering that is of high quality is critical to capital project success. It only makes sense that capital project systems should focus on measuring and improving engineering quality as a key aspect of their improvement efforts. The problem is that Industry does not have robust measures for assessing engineering quality, pushing back on poor engineering quality, or even understanding what today's standard of quality should be. The current market environment only amplifies the need to measure and improve engineering quality for the health of our Industry. The objective of this study is to establish a basis for measuring engineering quality on capital projects and to offer strategies that some member companies are implementing to improve engineering quality.

**Digitalization's Role in Standardization:** The process industries are facing a crisis. Engineering, procurement, and construction (EPC) firms are withdrawing from process industry work because it is high risk and low reward. Our work requires precise engineering and mistakes can be catastrophic in terms of safety. Meanwhile, process-oriented EPCs are making tiny returns on revenue. This means that standardization of technology and designs will become increasingly essential because standardization reduces the need for new engineering. Digitalization may make standardization actually work for the industry for the first time. This study will look at using digitalization technologies as a path for achieving true standardization.

**Closing the Operational Production Gap:** Cost, schedule, and operability are the triumvirate of performance outcomes resulting in value on capital investments. Assessing the three collectively is key to understanding the full story of whether a project delivered on its promises. The primary goal of this study will be to help member companies examine and mitigate against the most influential early risk factors in business-led decision-making that affect operational performance. Simply put, what is it that businesses need to do to avoid a colossal waste of capital in underutilized assets?

## FEL Toolbox Software Updated for Spring 2021!

IPA's **Front-End Loading (FEL) Toolbox** software has been the gold standard for site and sustaining capital project self-assessment for nearly 20 years. We are excited to share that the spring 2021 release of the software includes significant improvements to the overall user experience:

**Redesigned user interface and navigation**

**Improved page layout, graphics, and readability**

**Improved navigation**

**Enhanced security**

IPA research has shown that FEL, or project definition, is one of the most significant drivers of success for capital projects. The FEL Toolbox software aids the project definition work process to help improve project outcomes and return on capital investments.

**To request a demo, contact Katherine Marusin**, IPA Manager, Site and Sustaining Capital, at kmarusin@ipaglobal.com.

# IPA-MIMOSA Digitalization Working Group to Meet Monthly Throughout 2021

IPA and MIMOSA (an industry trade association dedicated to the development and adoption of information technology and information management standards) have teamed up to form the **IPA-MIMOSA Open Industrial Interoperability Ecosystem (OIIE) Capital Project Working Group**. This digitalization working group will meet monthly to help align the efforts of owner companies; engineering, procurement, and construction (EPC) firms; industry standardization organizations (e.g., IOGP/CIFHOS, ISA, MIMOSA); and international standards organizations (ISO, IEC). All participants work together to set the owner/EPC firm priorities for solution delivery to enable pragmatic industry digital transformation on a timely basis.

Whether your company's digitalization goals are productivity improvements, capital efficiency, advanced work packaging, facility hand-off to operations, or digital twins, interoperability between the many players in the asset life cycle is a key success component. Historically, interoperability has been difficult to achieve due to a lack of alignment throughout the industry between owner/operators, EPC firms, material and service suppliers, and subject matter experts. This initiative seeks to resolve this issue for the benefit of all industrial sectors moving forward.

The digitalization working group will meet virtually throughout 2021, typically on the third Tuesday of each month. Topic-specific sub-teams will be formed to define owner's business use cases for the standards communities. IPA and MIMOSA invite project professionals around the world to join and contribute to the initiative.

Visit **https://www.ipaglobal.com/services/digitalization/** for more information on how to join.

# Downloadable Webinars

To access the recordings and slide packs visit: **www.ipaglobal.com/resources/webinars**

### How the Capital Projects Industry Is Responding to COVID-19

IPA has been keeping the capital projects industry informed of how companies are responding to the COVID-19 pandemic. Jason Walker, IPA Deputy Director of Research, shares updates on how the industry is working to secure supply chains, adapt construction work sites to keep workers safe, and re-balance project portfolios. (Recorded in December 2020)

### IPA Snapshot Demonstration Webinar

IPA's *Snapshot: Subsea Tieback* is a cloud-based software solution that delivers real-time benchmarking and readiness information for fast-paced subsea tieback projects. In this webinar, IPA Energy Research Leader Jon Walker provides an up close look at how *Snapshot* facilitates rapid decision-making for project teams. (Recorded in September 2020)

### Moving Forward With Digitalization in the Time of COVID-19 and Economic Crisis

In this webinar, Deb McNeil, IPA Capital Solutions Director, reports on the results of a recent IPA survey on the effect of COVID-19 and the economic crisis on digitalization efforts. (Recorded in August 2020)

### Making Smart Resource Decisions in the Midst of a Crisis

To deliver projects effectively when capital work resumes, it is imperative that owner companies make smart decisions now with regard to resource cuts. Sarah Sparks, IPA Product Development Leader, Organizations & Teams, hosted this live webinar sharing key project organization staffing data and information needed for smart decision-making. (Recorded in June 2020)

# IPA Institute Adds New Stakeholder Alignment Course and More to the 2021 Training Schedule

The IPA Institute continues to deliver virtual training courses on capital project planning and delivery to project professionals across all industrial sectors. The IPA Institute's newest offering, **Project Stakeholder Alignment Through Successful BEAM Application**, will debut on April 21, 2021. The half-day course shares the qualities of a successful Business Engineering Alignment Meeting (BEAM), the widely accepted industry Best Practice used to achive stakeholder alignment. Participants will learn about the key roles and functions that must participate, the right time in the project lifecycle to conduct the BEAM, and how to develop an action plan for successful BEAM application.

In addition to the new stakeholder alignment course, the IPA Institute has scheduled four of its most-requested classes to take place in May: **Project Management Best Practices**, **Front-End Loading and the Stage-Gated Process**, **Establishing Capital Cost & Schedule Processes**, and **Capital Project Execution Excellence and Project Controls**. See below for dates, times, fees, and registration links.

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

| Course | Dates | Times | Language | Fee | Click to Register |
|---|---|---|---|---|---|
| Capital Project Execution Excellence and Project Controls | March 29 & 31 | 9 a.m. to 11 a.m. (UTC-4) | English | $400 USD | REGISTER |
| Front-End Loading (FEL) and the Stage-Gated Process | March 30 & April 1 | 10 a.m. to 12 p.m. (UTC-3) | Portuguese | $300 USD | REGISTER |
| Project Management Best Practices* | April 5-9 | 9 a.m. to 12 p.m. (UTC-4) | English | $1,200 USD | REGISTER |
| Gatekeeping for Capital Project Governance | April 13-15 | 9 a.m. to 11 a.m. (UTC-4) | English | $600 USD | REGISTER |
| Capital Project Execution Excellence and Project Controls | April 19 & 21 | 10 a.m. to 12 p.m. (UTC-3) | Portuguese | $300 USD | REGISTER |
| Project Stakeholder Alignment Through Successful BEAM Implementation | April 21 | 9 a.m. to 12 p.m. (UTC-4) | English | $300 USD | REGISTER |
| Project Management Best Practices* | May 10-19 | 10 a.m. to 2 p.m. (UTC+10) | English | $1,650 USD | REGISTER |
| Front-End Loading (FEL) and the Stage-Gated Process | May 11 & 13 | 9 a.m. to 11 a.m. (UTC-4) | English | $400 USD | REGISTER |
| Establishing Effective Capital Cost & Schedule Processes* | May 17-21 | 9 a.m. to 11 a.m. (UTC-4) | English | $1,000 USD | REGISTER |
| Capital Project Execution Excellence and Project Controls | May 25 & 27 | 9 a.m. to 11 a.m. (UTC-4) | English | $400 USD | REGISTER |

# IPA Events and Presentations

**Major Projects Association: Reimagining Benchmarking**
March 17, 2021
Virtual Seminar

IPA Founder and President Edward Merrow will serve as Chairman of Reimagining Benchmarking, a Major Projects Association (MPA)-sponsored virtual seminar on March 17, 2021. The 4-hour seminar aims to help prepare the capital projects industry for increasing pressure to improve project performance and deliver value in the post-COVID-19 world. For more information, visit https://www.majorprojects.org/events.

**Industry Benchmarking Consortium (IBC)**
Begins March 23, 2021
Virtual Meetings

Established in 1992, the IBC is a premiere 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.

**IPA-MIMOSA OIIE Capital Project Working Group**
April 20
Virtual Meeting

The IPA-MIMOSA Open Industrial Interoperability Ecosystem (OIIE) Capital Project Working Group is focused on defining the high-value interoperability use cases for digitalization standards in the capital project industry. In 2021, the interactive working group will meet virtually on the third Tuesday of each month to continue developing value-driven requirements and guidance on international standardization efforts. Please contact Deb McNeil at dmcneil@ipaglobal.com for details on how to join.

**Upstream Cost Engineering Committee (UCEC)**
June 2021
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 Andrew Griffith at agriffith@ipaglobal.com for more information.

**Cost Engineering Committee (CEC)**
September 2021
Details to Be Announced

The CEC is a working subcommittee under the Industry Benchmarking Consortium (IBC) that 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 Andrew Griffith at agriffith@ipaglobal.com for more information.